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Sand Handling Mechanized



New Storage and Mixing Department at Packard

Foundry Saves Labor and Protects

Sand from the Weather

BY HENRY M. LANE

FOR receiving and storing incoming sand and transporting it into its foundry the Packard Motor Car Co., Detroit, has recently put in a sand storage and sand handling system.

Formerly sand was stored in a series of bins along a railroad track, the sand being shoveled or wheeled from cars through doors in the side wall of the bins. It was subsequently taken out of the bins by shoveling it into trucks, which conveyed it to the sand mixing department. With the growth of the plant it became necessary to store far more material than the bins would accommodate, and hence a considerable portion of it had to be exposed in the open each winter, to be reclaimed later and brought into the foundry. This double handling of the sand added materially to its cost. Moreover, the sand stored in the open froze during the winter, making it difficult to handle and necessitating its being thawed out before going to the mixers.

The old sand mixing equipment consisted of two 6-ft. Simpson mills with loaders. All material had to be brought to these mixers in trucks or wheelbarrows. In the rearranged plant the Simpson mills were left in the same position they occupied before, and the new layout was built around and over them.

The two sand mixers, together with the equipment for handling sand from storage, are shown in the general vertical and horizontal cross-sections. In the plan view may be noted a track hopper that projects from the building under the railroad track. The sand is dumped directly from hopper-bottom railroad cars into the hopper for mechanical handling into storage. An electric pulling winch is used to shift cars to position over the hopper and, as they are emptied, to move them down the track for storage.

Sand discharged from the cars into the hopper is passed into the building by a pan feeder, which delivers it to a vertical elevator. This elevator, designated as

No. 1 in the drawings, carries the sand up to a point above a series of storage bins, discharging it on a distributing belt. The belt extends the entire length of the storage building, and is equipped with a traveling plow, which is used to deliver the sand from the belt into the various bins. The storage space is 33 to 35 ft. wide x 165 ft. long x 44 ft. deep, with a capacity to hold 11,000 tons of various grades of sand. The two largest bins are for core sand, one for sharp sand and the other for bank sand. A bin for aluminum molding sand has a capacity to hold a winter's requirements for the aluminum foundry. In addition, there are three bins for different grades of molding sand and one each for silica sand and tailings. All of the bins except those for silica sand and tailings have discharge gates in the bottom, connecting with a sand recovery tunnel below.

The storage building is of reinforced concrete construction and adjoins the foundry. No heating pipes or other heating equipment have been provided in the storage area. Sufficient heat escapes from the foundry into the bins to prevent the sand from freezing.

The bins are designed so that the walls and floors are essentially concrete slabs, tied together by a grillage of concrete beams. In the case of the large bins division walls were not used between each successive panel. A steel superstructure above the concrete beams carries the sand distributing belt.

The unloading of sand from cars can be handled by a crew of only two men at a rate of 40 to 50 tons per hr., depending on the character of the sand and the ease with which it flows from the car into the track hopper. Last fall some of the molding sand was received in open cars during a very rainy period, making it difficult to handle, and the capacity of the equipment, at times, fell below 40 tons per hr. However, with sharp sand or fairly dry bank sand, approximately 50 tons per hr. is easily handled.

For handling sand from the bins to the mixers a



INCOMING Sand (at Left) Is Elevated to a Distributing Belt, from Which It Is Discharged by a Traveling Plow to the Various Storage Bins

MOST of the Sand Is Received in Hopper-Bottom Cars, Which Are Discharged into the Track Hopper, from Which the Sand Is Transferred by a Pan Feeder to the Sand Handling System. In the house adjacent to the track hopper is an electric winch, which is used to shift cars up and down the track

concrete tunnel was provided underneath the storage building. The reinforced concrete construction was designed to take care of a load of over 4500 lb. per sq. ft. bearing directly on the roof of the tunnel. Sand is discharged from the bins into the tunnel by undercut gates.

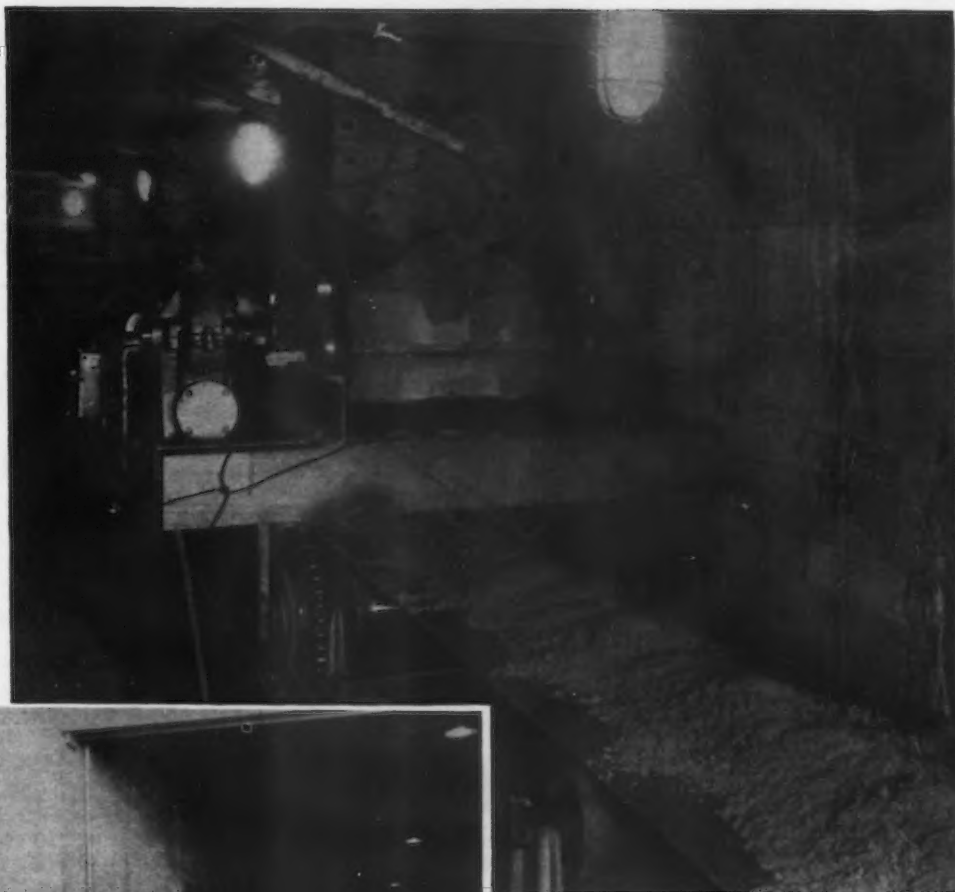
To control the flow of the sand, a special pan feeder was introduced, which feeds the sand to a continuous belt that extends through the entire length of the tunnel. Since the tunnel is intersected by a general service tunnel, which carries electric wires and steam pipes from a power house to other units of the Packard plant, it was necessary to install two feeders, one on each side of the power tunnel. The pan feeders are moved along the belt by power and can be placed in position to feed sand to the conveyor at any given point. In operation it is merely necessary to run a feeder under a given undercut gate, open the gate, and start the conveying belt.

The conveyor discharges into elevator No. 2, which in turn delivers the sand to a continuous belt above a series of four steel bins, a pair for each of the mixing mills. In both cases one bin is for bank sand and the other for sharp sand. A series of signal bells enables the operative in the tunnel to coordinate his movements with those of a man on top of the bins in the mixing plant. As a result these two men can take sand from storage at the rate required by the mills. Under



TOP of Storage Bins (at Left) under Distributing Belt Runway. In order to tie together the vertical slabs that compose the walls of the bins, it was necessary to provide a series of horizontal girts and to support these by reinforced columns. The conveyer system is carried on a light steel structure above the bins

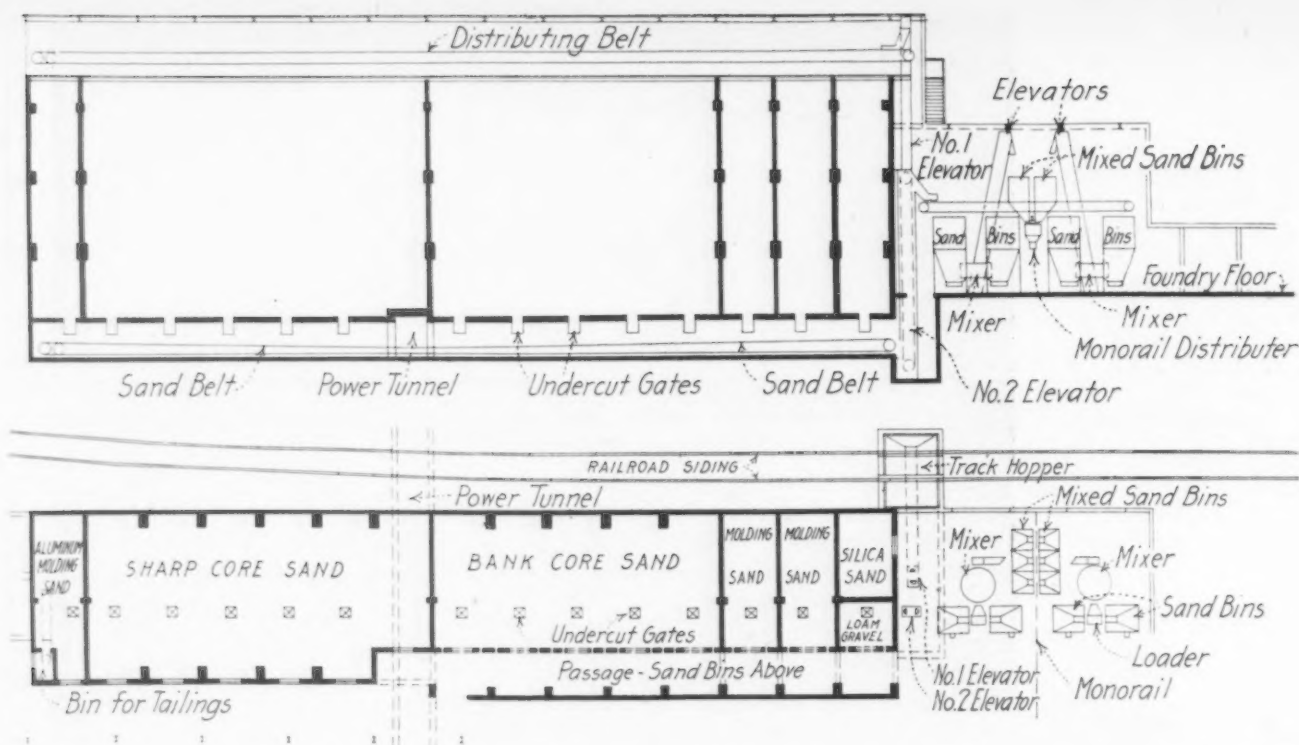
*S*AND from the Bins is Delivered by Under-cut Gates to a Tunnel Below. A movable pan feeder, which is spotted under the various gates, transfers the sand to a sand recovery belt



*A*LONG the Side of the Bins Is a Series of Doors Closed with Louvres, through Which Access May Be Gained to Obtain Small Amounts of Sand that May Be Required for Special Purposes. At the end, as shown in the foreground, is a tailings bin, into which any overflow from the distributing belt is spouted

A LOADER for one of the Simpson Mixers Is Shown between Two Bins, One of which Contains Bank Sand and the Other Sharp Sand. Each bin has a pneumatically controlled measuring gate. On the ceiling to the right may be seen a monorail, which is used to distribute mixed sand to the core benches





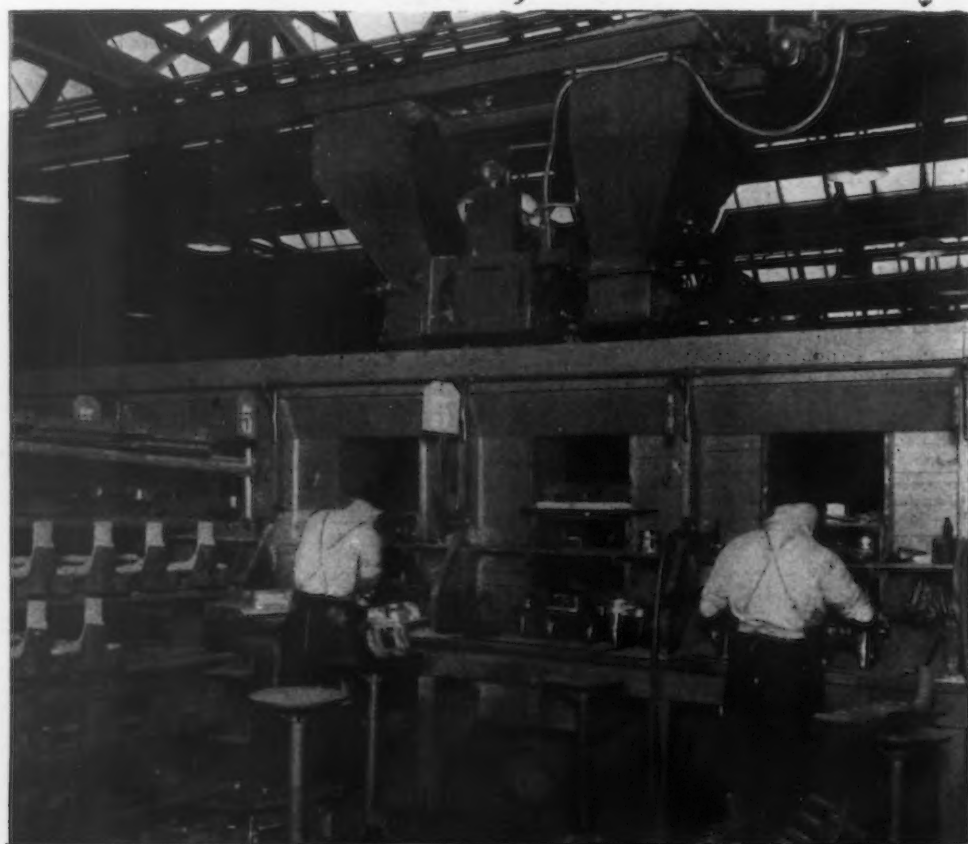
PLAN View of Sand Bins and Sand Handling Equipment, with Longitudinal Section Shown Above. The storage building was constructed between the foundry and the railroad track, taking the place of bins of limited capacity. The problem was to keep the sand mixing mills in continuous operation and at the same time to provide sufficient storage to take care of increased sand requirements. Hence deep reinforced concrete bins were constructed

each pair of bins is a loader serving the mixers. Each bin is equipped with a special measuring gate, operated by compressed air, which controls the amount of sand discharged into the loaders. When the operator has put the proper amount of each grade of sand into the loader, he adds any amount of dry binder that may be required and then dumps the entire charge into the Simpson mill. After the charge is in the mill, the proper amount of liquid binder and water is introduced from a measuring device beneath the bins. This is a

receiving cylinder into which the proper amount of oil is forced by compressed air, later being forced directly into the mixing machine.

The sand mixed in the mills is discharged directly into the boots of two elevators which deliver it to a series of eight overhead mixed sand bins, located above a distributing monorail. An operator in a small monorail cab equipped with two hoppers passes under these bins, fills the hoppers, and then travels to the core room, where he discharges the sand into bins over the core-

THE Monorail Operator Runs his Cage under the Mixed Sand Bins in the Mixing Department, Fills his Hoppers, and then Delivers the Sand to the Core-makers



makers' benches. The monorail hoppers are located on each side of the operator's cage, and they may be used to carry two grades of sand or the same grade.

To keep track of the distribution of the various grades of sand the different mixtures are numbered. Numbered placards hung before the coremakers indicate the particular mixture of sand used on each bench.

The mixing department is not wholly dependent on the conveying belt under the storage bins for a supply of sand. Provision has also been made so that sand can be shoveled out of the bins into trucks if necessary, and for this purpose each unit has a door closed with wooden louvres. The tailings bin, which has been placed at one end of the storage building, is so arranged that it will receive any overflow that sticks to the overhead dis-

tributing belt and is passed on to the end of the system. Such sand may be taken out of the tailings bin and used immediately. In practice, however, the plows work sufficiently close to the distributing belt so that practically nothing passes down the tailings spouts.

The system of handling, storing and mixing sand at the Packard plant has greatly reduced the number of man-hours consumed, first, in the transfer of incoming sand to storage, second, in the recovery of sand from storage and its delivery to the mills, third, in the mixing of sand and, fourth, in the distribution of sand to the foundry. The sand handling equipment has eliminated the use of shovels except for cleaning out cars of incoming sand or for picking up spillage about the mixing room.

Gripping Force Exerted by Ingot Tongs

Some Necessary Considerations in the Successful Design of These Tools — Avoidance of Slippage Essential

INVESTIGATIONS made in England into reasons for poor operation of ingot tongs developed the fact that, under certain conditions, the expected gripping force is not exerted. These conditions involve consideration of the width of opening between the dogs and the angle through which the toggle acts. As detailed in *Engineering*, London, by W. E. Wright, an analytical study of the tongs which proved defective has thrown considerable light on the subject. A similar analysis, applied to tongs which gripped the ingots successfully, was used in correlating the results.

The coefficient of grip, which may be regarded as analogous to a special coefficient of friction, is given

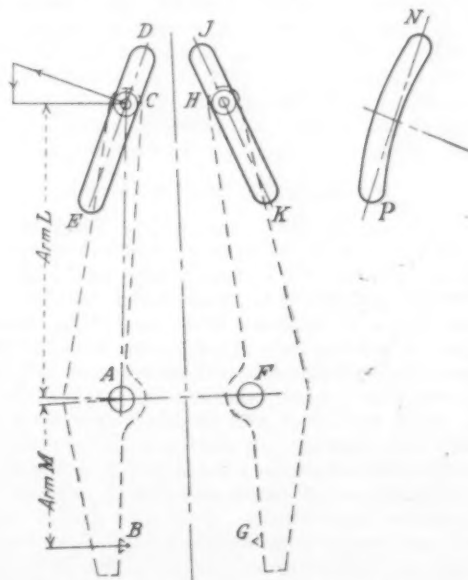
by the writer as $\frac{1}{2T}$, in which T is the thrust between the dog and the ingot. In his analysis of defective tongs and successful tongs the various widths of openings or widths of ingots are given, alongside the gripping force and the required coefficient of gripping. These are shown in Table I, the first five items of which represent defective tongs, while the last eight are successful tongs. It will be noted that the defective tongs, practically without exception, have a required coefficient of gripping much higher than the successful tongs.

In some smaller sizes of ingots some of the tongs slipped over the surface without lifting. Above an ingot thickness which varied for different tong designs, however, the ingots could be picked up and carried about by the crane. In practically all cases, those over 18 in. were picked up and handled readily. In making the analysis the gripping force for the extreme positions of each set were obtained graphically.

Referring to Fig. 1, a few notes on the design of new tongs are given. To obtain the best possible gripping effect, the designer should aim at making the angle between the slot DE and the arm AC as acute as possible. The points D and J should be brought as near the axis as possible, yet must be far enough apart to allow the passage of the pivot forging between them.

The points A and F should be as far apart as possible. However, if they are too far out, the slope of AB and FG will not be good when lifting small ingots.

By lengthening the vertical height of the slot DE (and JK) the inclination will be reduced. The inclination of AC will be increased by shortening the arm L , but the arm M must be reduced in proportion and the



Width of Opening Between B and G , with Relation to Length of Arms, Has a Decided Bearing on Gripping Efficiency. Curved slots, as at $N P$, may eliminate the variations

limit is fixed by necessity for leaving clearance for the top of the ingot between the dogs and the pivot forging. On the other hand, a lengthening of these two arms would produce a smaller change of inclination in AC and, therefore, a smaller variation between maximum and minimum positions. As a general rule, the amount of vertical height available will fix a definite limit beyond which the arms cannot be increased in length.

It is possible to eliminate the variation in gripping force by the use of curved slots (replacing the straight slots DE and JK) in the guide plates. In thus obtaining a greatly improved condition at the lower end of the range, there is a corresponding reduction in the gripping force at the upper end. Very slight curvature is sufficient to equalize the values at the two ends. The curve must be smooth and continuous on the working side.

Table I—Analysis of Gripping Action of Ingot Tongs

Width of Opening Between Dogs, Defective Tongs, In.	Gripping Force on Each Dog Per One Ton Ingot, Tons	Required Coefficient of Gripping
22	1.63	0.306
14	1.16	0.430
12	1.07	0.466
8	0.92	0.545
5 1/2	0.85	0.589
Successful Tongs		
7	2.00	0.250
15	3.20	0.156
12	2.20	0.227
20	3.64	0.137
14	1.50	0.333
27	5.30	0.095
8.7	1.63	0.307
18.7	4.54	0.110



Special Steel for Hudson Bridge

Record Breaking Structural Project Includes Nearly 40,000 Tons of Alloy Steel, and If Made with Chain Cable, 60,000 Tons of Heat Treated Eyebars

A NEWS note of major interest last week was the announcement that bids for the huge suspension bridge to span the Hudson River at New York would be opened on Oct. 3, and would involve a total of about 150,000 tons of steel. While this will be the largest structural contract ever let, the tonnage is not the only unprecedented feature of the project. The span will be 3500 ft. (as compared to the 1600-ft. Brooklyn bridge, and the 1750-ft. Camden-Philadelphia bridge), the cost will approach \$75,000,000 and it will carry eight traffic lanes for vehicles on the upper deck and four tracks for rapid transit on the lower.

No Especially Big Members

It might be thought that such a large structure would involve pieces of unusual magnitude, requiring special equipment in the fabricating shop. However, an effort has been made to avoid this, according to L. S. Moisseiff, advisory engineer of design. Thus, while the main towers will be made of structural steel (as are the Delaware River bridge towers) each tower will consist of 16 columns, braced together to form a complete whole. Each of the 16 will have a maximum 6 ft. by 6 ft. box cross section, as shown in the sketch, which as structural members are made today, is quite moderate. Thicknesses of plates and shapes are kept below $\frac{7}{8}$ in. where possible, so that rivet holes may be punched and reamed, rather than drilled, as would be necessary on thicker webs. In fact, the Port of New York Authority's engineers (who are constructing the bridge) believe that no unprecedented problems will be encountered either in the fabrication or erection; pointing out that whereas a cantilever bridge embraces a relatively small number of big members, a suspension bridge requires a large number of small members. Of

course, the usual rigid inspection and shop assembly will be required before shipment to the site.

In the architect's perspective drawing masonry towers are shown. This masonry sheathing is erected to protect the steel within, as well as for aesthetic considerations. It also reinforces the steel work to a considerable extent, providing an ample margin of safety for the maximum expected future loads.

Alternative Designs

Bids are being asked on two separate designs. One uses wire cables for the main suspension, and the other a chain of forged, heat treated eyebars. Designing engineers are not agreed as to the relative merits of these two, and actual bids will be required to determine the respective costs.

Wire is the conventional material of construction, and it has a uniformly good record in service. An accompanying table (from *Engineering News-Record*, Aug. 11, 1927) gives some data on notable American bridges, indicating the steadily growing reliance put upon wire suspension cables:

Bridges Using Wire Suspension Cables

Bridge	Completed	No. of Cables	Diam. of Cable, In.	No. Wires per Cable
Cincinnati	1867	2	12 $\frac{1}{4}$	2,590
Brooklyn	1883	4	15 $\frac{3}{4}$	5,358
Williamsburgh . .	1903	4	18 $\frac{3}{4}$	7,696
Manhattan	1910	4	21 $\frac{1}{4}$	9,472
Delaware River . .	1926	2	30	18,666
Hudson River . . .	....	4	36	26,474

Wire is a material which recommends itself to the structural engineer's mind; the method of manufacture not only imparts high physical properties to the metal, but is also a test for quality. Routine tests on the wire used in the Delaware River bridge were so satisfactory and so high that the average tensile strength specified

Characteristics of Alloy Steels for Hudson River Bridge

Chemical analysis	Silicon Steel		Nickel Steel	
	Hudson River Bridge	A. S. T. M. Specifications	Hudson River Bridge	A. S. T. M. Specifications
Carbon, per cent.	0.40 max.	0.40 max.	0.40 max.	0.45 max.
Phosphorus, per cent. . . .	0.04 max.	0.04 max.	0.04 max.	0.04 max.
Sulphur, per cent.	0.04 max.	0.05 max.	0.05 max.	0.05 max.
Silicon, per cent.	0.20 to 0.45	0.20 min.	1.00 max.	0.70 max.
Nickel manganese . . . . .	.....	.....	3.25 min.	3.25 min.
Tensile properties				
Ultimate, lb. per sq. in. . . .	80,000 to 95,000	80,000 to 95,000	90,000 min.	85,000 to 100,000
Yield point, lb. per sq. in. . .	45,000 min.	45,000 min.	55,000 min.	50,000 min.
Yield point, average for 10 heats. .	47,000 min.	.....	.....	.....
Elongation in 8 in., per cent. . .	1,500,000	1,500,000	1,600,000	1,500,000
Reduction of area, per cent. . . .	Tensile Strength 30 min.	Tensile Strength 30 min.	Tensile Strength 30 min.	Tensile Strength 25 min.
180 deg. bend test around pin				
$\frac{3}{4}$ in. material or less	D=1T	D=1T	D=1 $\frac{1}{2}$ T	D=1T
$\frac{3}{4}$ in. to 1 in.	D=1 $\frac{1}{4}$ T	D=1 $\frac{1}{2}$ T	D=2T	D=2T
1 in. to 1 $\frac{1}{4}$ in.	D=1 $\frac{1}{2}$ T	D=2T	D=2T	D=2T

for the Hudson River bridge is 5000 lb. more than for the former. Wire is also a material which at least three companies are able to fabricate in the necessary tonnage.

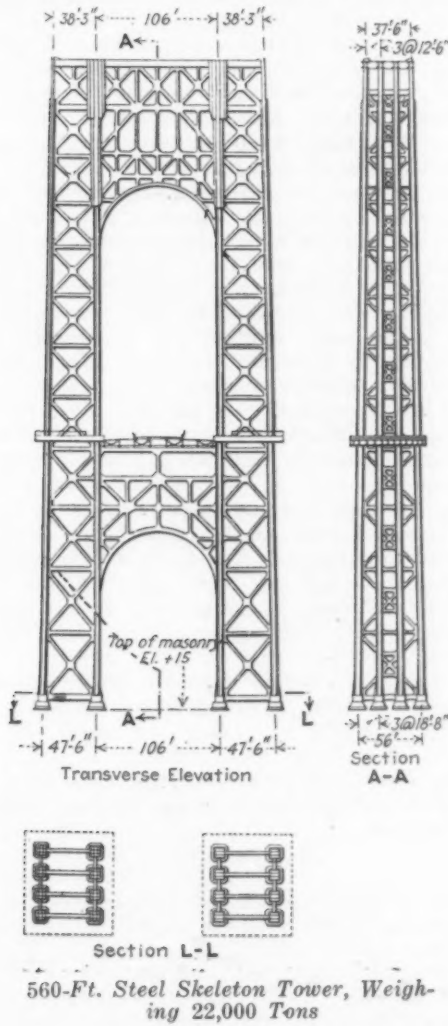
Former Use of High Strength Eyebars

Eyebars, pin connected at the ends, are well known structural elements. They comprise the main tension chords of the notable bridges here listed.

Bridge Using Eyebars Suspension

Bridge	Completed	Span, Ft.	No. of Bars	Size, In.	Ultimate Strength, Lb. per Sq. In.
Memphis	1892	790	12	10x1 1/2	62,000
Queensboro	1909	1182	20	16x2 1/4	85,000
St. Lawrence...	1918	1800	32	16x2 1/4	80,000

Bars made of the material used in the St. Lawrence bridge, however, have not the strength required for so long a span as the Hudson River crossing. This will require high strength metal developing 105,000 lb. per sq. in. ultimate strength. Even using this material, the suspension member on one side would be made up of 96 bars, each 16 x 2 1/4 in. in section, the whole weighing approximately double that of the wire cables. Two things are held to count somewhat against high strength eyebars: The history of this material is limited to one long suspension bridge at Clorionapolis, Brazil, completed within the last two years. It is also emphasized



that only one company, the American Bridge Co., is now equipped to manufacture such bars in large tonnage.

Tonnage Required

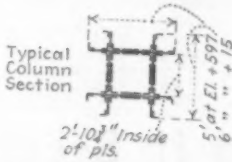
Estimated weights of metal in the two designs are given in an accompanying table.

This material will be bought under American Society for Testing Materials specifications. Additional matters covered in the specifications issued by the Port Authority are as follows:

All steel must be of American manufacture by open-hearth or electric furnace. Each finished piece must

have melt number and name of maker stamped or rolled on it.

Structural carbon steel has the same chemical requirements as the A.S.T.M. specification (P not over 0.04; S not over 0.05), but the tensile strength range has been increased 3000 lb. to 58,000 to 68,000 lb. per sq. in., and the minimum yield point increased 5000 lb. to 35,000. Minimum reduction of area of 42 per cent



Typical Section of One of the Sixteen Columns Comprising the Main Tower

is also required. Less severe bend tests are required: 3/4-in. material or less must bend 180 deg. about a pin equal to the thickness; thicker material must bend about a pin equal to 1 1/2 times the thickness.

Carbon rivet steel has even higher physical properties: the A.S.T.M. limits of 46,000 to 56,000 are increased to 52,000 to 60,000 lb. per sq. in. ultimate; minimum yield point is increased 5000 lb. to 30,000 lb. per sq. in., and minimum reduction of area of 52 per cent is required.

Structural silicon steel, to be used in unheat treated condition, is required as given in the table (A.S.T.M. standards given as reference). Data on nickel steel to be used to a minor extent in the upper floor system (which is all that is to be built when the bridge is opened for traffic) are also included.

Weights, in Pounds, for a Bridge of the Two Designs

	Wire Cable Design	Eyebars Cable Design
Cable wire.....	57,200,000	.....
Wrapping wire.....	830,000	.....
Heat treated eyebars.....	.....	114,200,000
Heat treated pins.....	170,000	5,640,000
Heat treated eyebars in anchorages	10,550,000	10,550,000
Heat treated eyebars for test	270,000	3,700,000
Carbon steel in anchorages	8,490,000	9,730,000
Carbon steel in towers....	30,400,000	32,200,000
Carbon steel in floor.....	12,300,000	12,320,000
Silicon steel in anchorages	1,600,000	1,400,000
Silicon steel in tower....	47,600,000	56,000,000
Silicon steel in floor.....	16,400,000	17,800,000
Nickel steel in floor.....	4,700,000	2,500,000
Cast steel and iron.....	5,250,000	5,000,000
Bronze	40,000	40,000
Estimated weight, lb..	195,800,000	271,080,000

Heat treated eyebars (if used in the main suspension cable) will contain not more than 0.04 per cent phosphorus or 0.05 per cent sulphur. Minimum physical properties on full-sized bars are as follows:

	High Strength	Low Strength
Tensile strength, lb. per sq. in..	105,000	80,000
Yield point, lb. per sq. in.....	75,000	50,000
Elongation in 18 ft., per cent..	5	8

Any 12 consecutive tests must show an average ultimate strength 5000 lb. higher than noted, and an average yield 3300 higher. During the early stages of manufacture, 5 extra bars must be fabricated for each 100, and the inspector will select five for test at random. As satisfactory uniformity is shown, the relation may be reduced to 1 per cent, the intention being to test 3 per cent of the entire production. If any bar selected for test fails to meet the requirements, two more will be selected for random. If one of these fails to pass, the entire lot shall be re-heat treated. All bars will be tested for hardness by the Brinell test, which test "shall be considered merely as a rough measure of the strength of the individual bars."

Heat treated pins, bolts and rollers conform to the specification of high strength eyebars, except the minimum yield point is 60,000 lb. per sq. in.

Wire Cable Specifications

Steel for main cable wire must be analyzed from a test ingot poured from each melt and must not have more than 0.85 per cent carbon, 0.04 per cent phos-

phorus and 0.04 per cent sulphur. Wire billets must weigh at least 225 lb., and be free from surface defects which will produce seams. Cable wire before galvanizing shall measure 0.192 in., plus or minus 0.003 in., drawn in single lengths not less than 2000 ft., and capable of coiling cold, without sign of fracture, around a rod $1\frac{1}{2}$ times its diameter. It shall be galvanized in a bath containing 99.75 per cent pure zinc, containing not more than 0.03 per cent iron. After galvanizing the average gage must be increased 0.005 in. over the

bright wire. Coiling drums must be 5 ft. in diameter.

After galvanizing the wire shall show the following physical properties: Tensile strength, at least 220,000 lb. per sq. in. of gross cross section (including zinc coat). Elongation, at least 4 per cent in 10 in. while under tension. Yield point, at least 150,000 lb. per sq. in. of gross cross section (determined at the point where elongation is 0.70 per cent in 10 in.). Any 12 consecutive tests must average 5000 lb. higher in ultimate and 3300 lb. higher in yield point than the above.

High Copper in Steel Produces Poor Product

German Steel Made from Copper-Bearing Pig Irons—Sheet Steel
from This Iron Less Amenable to Dishing—
Surface Is Rough

AN expensive occurrence at one of the large German open-hearth steel mills, traceable to copper in the material, gave rise to a series of tests by Dr. W. Herwig. The results were published in *Stahl und Eisen*, March 24, 1927, page 491. The works in question were producing sheets intended for dishing out articles for kitchen use. A mixture of Westphalian high-manganese pig iron, a little purchased steel scrap and considerable basic Bessemer scrap of their own make was used. During the war it had become necessary to change the source of pig iron supply, and from then on there were constant complaints about the sheets as made. Since the mill practice had not been changed, the pig iron was investigated and found to contain considerable copper. Later on, when return was made to the old source of pig iron supply, these complaints returned to their original normalcy, and hence the blame for the losses was put on the copper.

Pig Irons Varied Widely in Copper Content

The literature of the subject gives somewhat conflicting opinions, doubtless due to the fact that researches were generally made with specially prepared copper-iron alloys. It is more satisfying, however, to compare actual operating results, and the first thing noted is the comparison of the analysis of the pig irons involved:

The high-copper pig iron had a total carbon of 3.78 per cent, the low-copper pig iron which gave no trouble ran 4.17 per cent in total carbon. Silicon was 0.80 and 0.96 per cent respectively. Manganese ran 3.57 per cent in the high-copper iron, and 4.23 per cent in the other. Similarly phosphorus ran 0.12 and 0.10 per cent; sulphur, 0.041 and 0.02 per cent; copper, 0.28 and 0.08 per cent respectively; arsenic, 0.04 per cent and traces; antimony and tin were present in traces in the high copper-iron, but none in the other metal. Taken in carload lots, the high-copper pig iron ran from 0.18 up to 1.04 per cent, whereas in the good iron it ran only from 0.07 to 0.10 per cent copper.

The shipments of the high-copper pig irons were traced to six separate blast furnace plants, thus accounting for the wide variation in the copper content.

Steel Made Was of Acceptable Composition

While the low-copper pig irons had a better composition than those with high-copper, it was found that, after going through the open-hearth, the differences were removed and both gave steel of acceptable composition. Thus: Carbon, 0.06 to 0.10; silicon, up to 0.06; manganese, about 0.80; phosphorus and sulphur, each up to 0.04 per cent. Occasionally the copper content of a sample ran higher than in the heat analysis. An investigation of an ingot was therefore made, and the result showed that the highest copper content—in the middle of the ingot, and drilled to a depth of 2.8 to 4.4 in.—ran together with the highest carbon, phosphorus, sulphur and nitrogen content. Another ingot, analyzed similarly, had an outer copper content running about 0.37 per cent and the center showing 0.48 per cent. The fact that the center of the ingots tested also showed high sulphur indicates that possibly copper and sulphur are present there as a

copper sulphide, which melts at about 1650 deg. Fahr. The nitrogen content was noted to be quite marked.

Rolled Surface Rough With High Copper

In observing the rolling of ingots into bars and sheets, whenever a high-copper content prevailed, the edges of the flames in the soaking pits were tinged with green. The rolling itself progressed normally. To clean the sheet of scale, they were run directly into hot water. Ordinarily the scale flies off easily and leaves the sheet with a smooth, dull gray colored surface. With high copper, however, the surface came out rough and badly spotted.

This characteristic was repeatedly brought out with polished steel bars in the laboratory, the high-copper material showing the dark spots on quenching, whereas steel comparatively free from copper did not. The reason for this behavior is doubtless the formation of oxide layers which, owing to their copper content, adhere to the metal surface and do not fly off. In rolling down to sheet for tin plate such spots may easily develop into the starting points for cracks, may produce brittleness and have strains. As a matter of fact, while no difficulty was experienced in rolling, the percentage of seconds rose when high-copper content prevailed.

Tests of high and low-copper sheets by pickling action indicated that, as the copper content rose the loss of metal decreased. The limit of this retardation was found to be 0.16 per cent copper. Above this, no appreciable difference in metal removal was found between sheets with high-copper content and those free from it.

The conclusions derived from the investigation were that copper is often responsible for rendering sheet steel less amenable to dishing out under the press, while in heavy work such difficulty is not noticed. That the difficulty in removing the scale from high-copper sheets gives them a rough surface and undesirable appearance.

The more than 1000 miles of cable and related equipment to be placed this year, on which construction work is well under way, call for an expenditure of nearly half of the \$34,000,000 total involved in the 1927 program of the Long Lines department of the American Telephone & Telegraph Co. For 1928 and several following years the long distance installations are expected to be about 1350 miles of cable a year. While cable routes are being steadily extended between the more populous centers of the country, open wire construction continues to play an important part in the country's communication system and new pole lines are still being built.

Production of bituminous coal in the week ended Aug. 13 reached 9,090,000 net tons, the highest figure for several weeks. It was only $14\frac{1}{2}$ per cent below the 10,628,000 tons of the corresponding week of last year, when there was no strike.

Powdered Coal for Plate Mills

Transport Line 1200 Feet Long — Substantial
Reduction in Heating Costs for Varying
Types of Furnaces

BY ROBERT H. IRONS*

FOR the past 70 years Central Iron & Steel Co., Harrisburg, Pa., with its plant now covering 82 acres, has manufactured steel plate products. The expansion of plate capacity to meet Government requirements during the World War resulted in excess capacity for normal times. As it would be years before demand would absorb this increased capacity under normal conditions, the company proceeded to study means of utilizing its enlarged open-hearth plan and diversifying its steel plate products so as to employ its steel capacity and existing plate mills more fully.

Considerable research work was conducted by the company's officials and consulting engineers were employed on several problems. Various types of additional mills, covering almost the entire range of finished steel products, were considered. In addition, gas machines, re-heating furnaces of more modern design, motor drives for the plate mills, waste-heat boilers in the open-hearth department, with an electric generating plant, water-works and condensers on the various steam units, together with numerous smaller improvements, were considered.

It was finally decided not to add other lines of manufacture, to employ more fully the steel-making capacity, but to concentrate on cost reduction in the plate mills, so as to manufacture smaller tonnages more economically and to diversify these products.

Re-Heating Costs Attacked

The outstanding item in the cost of manufacturing steel plates was the cost of re-heating in the mills. This heavy cost was due to the employment of different types of heating furnaces, two separate gas producing plants and high maintenance charges.

Four plate mills were served with a total of 15 heating furnaces and one soaking pit. Of these furnaces, seven were regenerating gas furnaces of two different types, served by the two separate gas pro-

ducing plants with hand-poked producers. The remaining furnaces were hand-fired air blast furnaces, to which several types of waste-heat boilers were connected. The soaking pit was gas-fired but not regularly employed, due to its rather obsolete design.

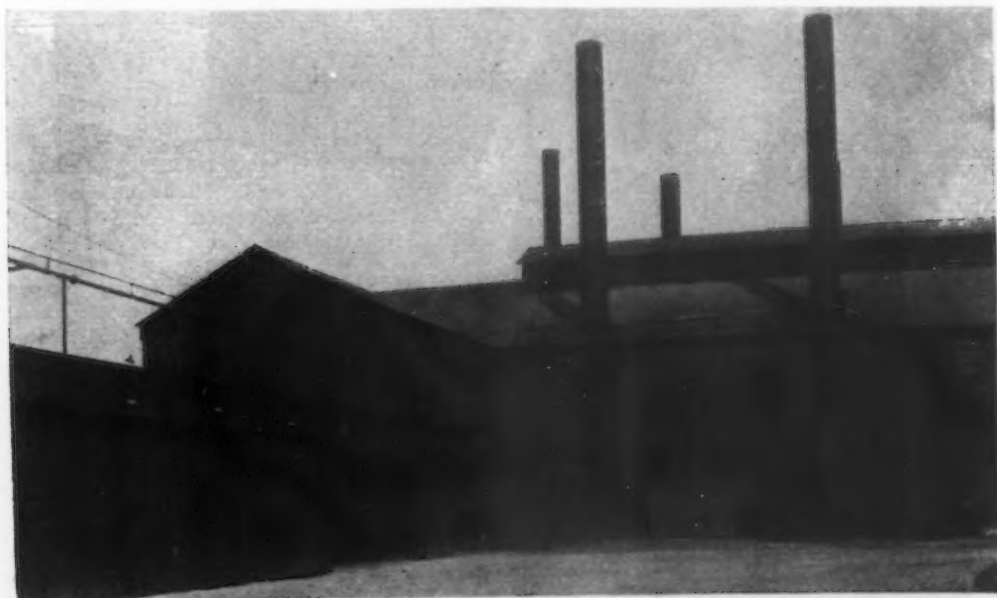
Powdered coal was finally decided upon as presenting the greatest opportunity for cost reduction, as it would enable the company to operate more economically when only a portion of its capacity was employed. It was realized that powdered coal had been a costly experiment in a number of instances. But it was also felt that this was due largely to lack of preliminary knowledge and that, with a small beginning and progressive improvement, serious errors could be avoided.

"By Trial and Error"

As a preliminary experiment, a unit pulverizer was installed on one of the hand-fired furnaces and, after trial, was discarded as impractical, due to lack of control and fine pulverization. Decision was then made to install a central pulverizing plant. The gas house of the 126-in. plate mill was selected for this development.

Installation of the initial pulverizing mill and its employment for a period of time without a drier, the changing of the regenerating gas furnaces to a type suitable for powdered coal, the application of this fuel to hand-fired air blast furnaces and the coordination of these activities, coincident with the operation of the various mills, is a long story which presented many difficulties, together with periods of uncertainty.

Opposition of the somewhat turbulent labor around the furnaces, the reluctance of skilled workmen to accept changes, together with the skeptical attitude of those in immediate authority, were problems that had to be overcome before the installation could finally be considered successful. The first step in the introduction of powdered coal was made in 1924 and in May, 1927, all but two hand-fired furnaces were put on this



COAL Transport Line Feeding Two Storage Bins at the Universal Mill. The line comes in from the left and the branches go to the bins at bases of the two stacks. Note absence of smoke, though the mill is running

* President Central Iron & Steel Co., Harrisburg, Pa.

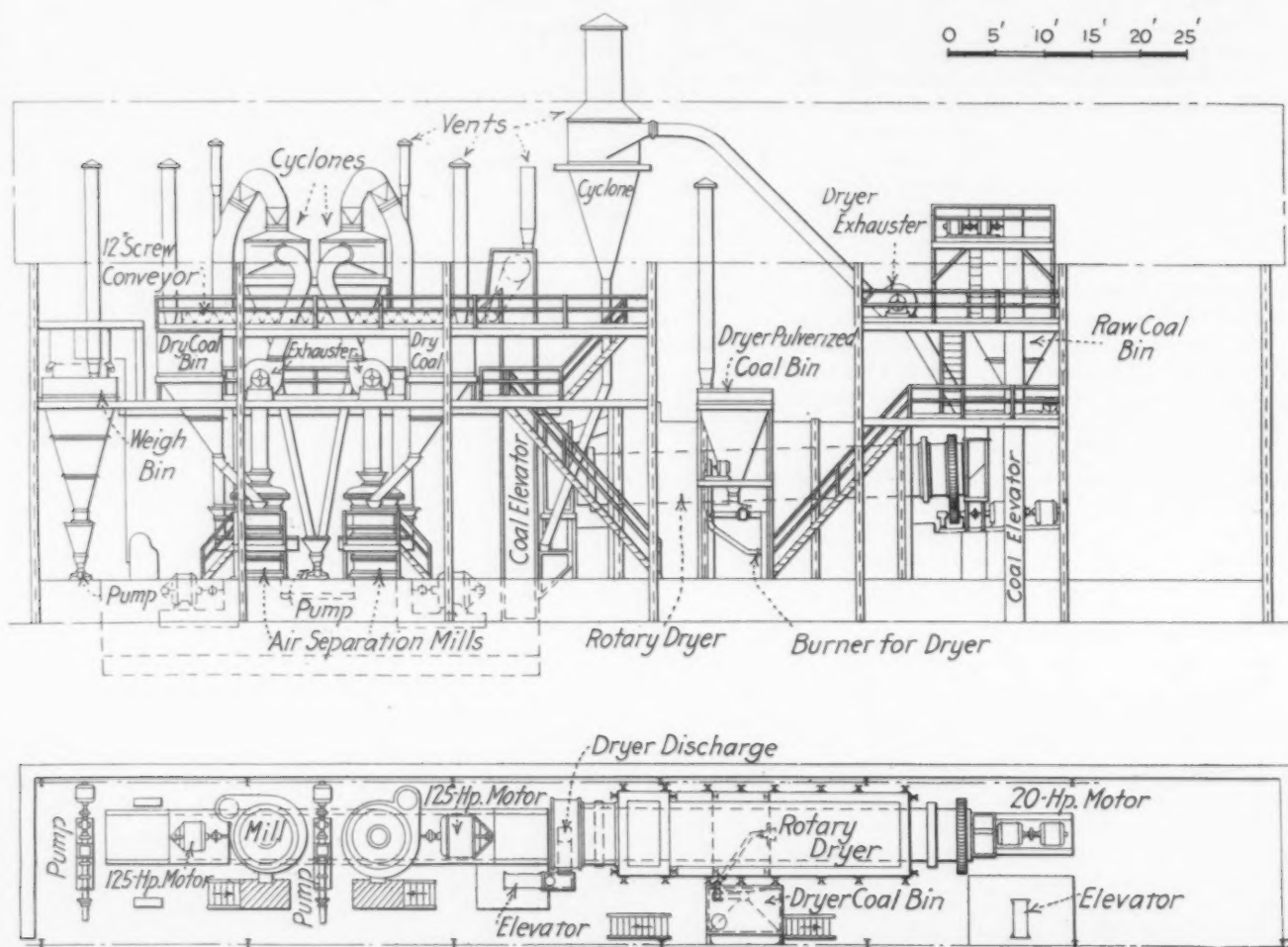
fuel. These remaining furnaces, located in the 72-in. plate mill building, are of the continuous type.

"Central" non-skid steel floor plates, one of the company's new products, can be manufactured on this mill. In the interest of service, should there be an accident at the central pulverizing plant, the company can still continue to supply this product, as well as a fair percentage of plain steel plates. That is the only reason that these furnaces have not been equipped for powdered coal. These floor plates are regularly manufactured on the 89-in. plate mill, which has been rebuilt and on which all furnaces are fired with powdered coal.

In addition to "Central" non-skid steel floor plates, which are manufactured under United States patent and are listed as Safety Appliance No. 443 by Underwriters' Laboratories, Inc., Chicago, and inspected by them, the company has added straightening rolls,

of powdered coal is the utilization of the space formerly occupied by the universal mill gas house and coal-handling equipment in consolidating the 126-in. mill and universal mill steel yards. The space formerly used as a steel yard for the 126-in. mill will be utilized for storage of spare machinery and parts. This consolidation will result in better deliveries of finished products from these two mills and enable the company to operate with lower steel inventories.

Powdered coal enabled the organization to solve a difficult problem as, in addition to the urge of economic necessity and with civic pride aside, the company was confronted with a recently enacted city smoke ordinance. While receiving the cooperation of the bureau's inspectors, the terms and conditions of the ordinance were unmistakable. The plant is located at the southern end of the city, in a thickly populated section. The disappearance of the black smoke, due to the use of



Layout of the Pulverizing Plant, in Elevation and Plan

squaring shears and an annealing furnace for the manufacture of blue annealed sheets. A new department was added for the manufacture of steel stampings, washers, etc., to diversify the plate products still further.

Indirect Benefits Important

The substantial reduction in costs, due to powdered coal, cannot be measured by a comparison of the direct costs only, such as fuel and labor, as the collateral benefits of this important installation are many. Lower costs when the mills are operated intermittently, lower furnace maintenance, elimination of ash handling, lower operating labor costs around the furnaces, stimulation of production due to increased heating capacity, better heating and an improvement in quality, all can be attributed to the use of powdered coal.

Among the collateral benefits derived from the use

of powdered coal, and the noticeably cleaner atmosphere are welcome to the citizens, as well as meeting the requirements of the smoke ordinance.

Description of the Powdered Coal Plant

SLACK coal is delivered to the track hopper, located outside the coal pulverizing plant, and then conveyed by means of a scraper conveyor to the coal crusher. From the crusher the coal is raised by a bucket elevator and dumped into a 10-ton capacity raw-coal storage bin, placed directly in front of the coal drier. This is a Fuller indirect-fired type rotating drier, fired with pulverized coal. Coal from the raw-coal bin is conveyed into the drier by a scraper conveyor driven by a variable-speed motor. This allows control of the amount of raw coal delivered to the drier.

TRANSPORT

Line from Storage Bin to Burners as Applied to Reheating Furnaces for Universal Mill. These furnaces were formerly of the regenerating gas type. Note the varying methods of obtaining a change of direction in the two pipes



The feature of being able to control the amount of coal so delivered is a decided advantage in obtaining a uniform moisture content in the dried coal.

Moisture driven out of the coal during drying, including combustion gases and fine coal dust, is removed from the drier by an exhaustor. It is discharged into a cyclone collector, where the gases and fine coal dust are separated, the gas leaving the collector through a stack to the atmosphere. The coal dust falls to the bottom of the cyclone collector, from where it is delivered to the dry-coal bucket elevator by means of a vertical pipe connection.

Dried coal discharged from the drier is passed over a magnetic separator for the removal of "tramp iron." It then is raised by a bucket elevator to the overhead screw conveyor, which carries it to the two 8-ton capacity dried-coal storage bins located above the two 48-in. Fuller-Lehigh air-separating grinding mills. The

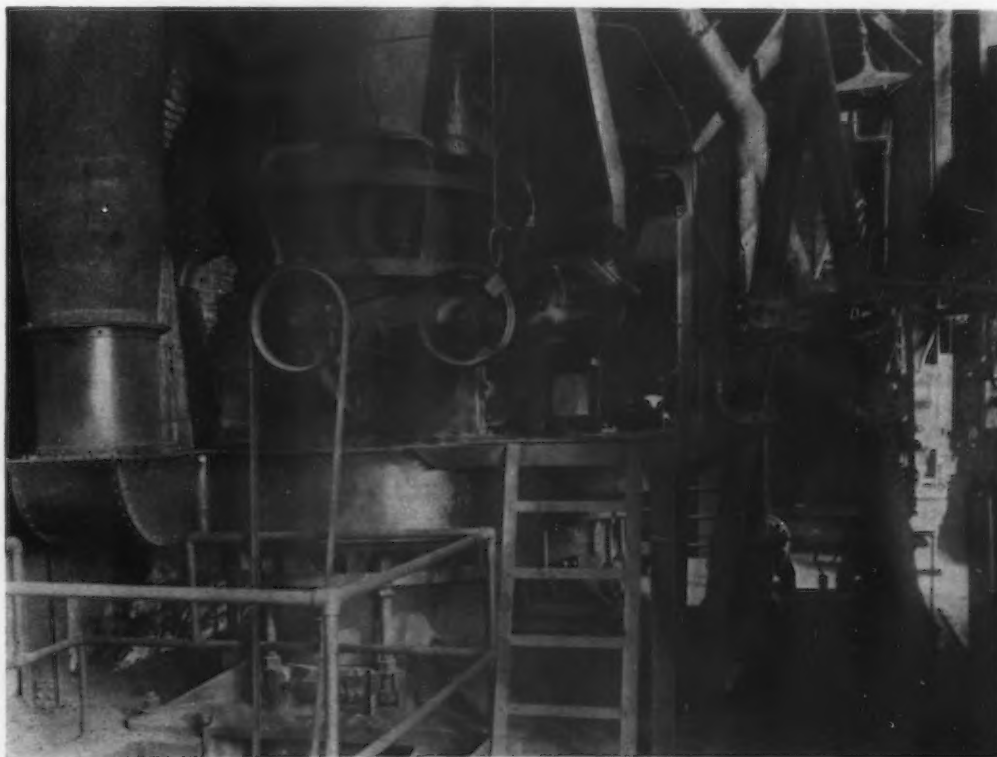
dried coal is fed by gravity from the storage bin to the two mills, which have a capacity of approximately 5 tons of pulverized coal an hour at a fineness of 85 per cent through a 200-mesh screen.

Each mill is driven by a 125-hp. motor. Each mill has an exhaustor which draws the pulverized coal from the grinding mill and discharges it to a cyclone collector, where the pulverized coal and air are separated. From the collector the pulverized coal is fed by gravity to either of two 6-in. Fuller-Kenyon pumps.

Transport Line Nearly ¼ Mile Long

Pulverized aerated coal is delivered by the pumps into a 4-in. diameter transport line of the unusual length of about 1200 ft. Air pressure varying from 45 to 60 lb. per sq. in. transports the coal to the 10-ton storage bins located in the plate mills. The amount of pulverized coal pumped into the storage bins at the

TWO 48-In. Standard Fuller-Lehigh Mills for Pulverizing the Coal and the Discharge Ends of Two Fuller-Kenyon Pumps (Lower Right) for Forcing the Powdered Coal Through the Transport Line



heating furnaces is controlled by an indicator, which signals the operator in the coal pulverizing plant when the bins are filled to an established level.

Pulverized coal is discharged from the storage bins by means of a Fuller-Lehigh screw feeder located at the bottom of the bins. The screw feeder is driven by a 2-hp. variable speed motor, which allows complete control of the amount of coal discharged. In connection with the screw feeder, which delivers the pulverized coal into a 4-in. diameter transport pipe, a primary air fan furnishing air at 10-oz. pressure per sq. in. transports the pulverized coal to the burners.

Secondary Air Used

In addition to the primary air which is mixed with the pulverized coal entering the furnace, additional secondary air is provided for combustion. This addition of air is supplied by a second fan with low air

to use coal having a high ash-fusing point and also to keep the moisture in the coal, after drying, less than 1 per cent. Equally important, the coal is ground to a uniform fineness of 85 per cent through a 200-mesh screen.

Coal prepared as indicated approaches gasification during combustion and the ash, by virtue of its velocity, traverses the hearth of the furnaces without settling on the steel being heated. The ash, after passing through the furnaces, settles in the flues of the original regenerating gas furnaces and in the base of the stack on the original hand-fired furnaces, and is collected and disposed of when necessary.

In the construction of the pulverized coal plant, the importance of dust-proof equipment was recognized. All elevators, conveyors, bins, etc., were made as dust proof as possible. Cleaning and inspection of the coal pulverizing equipment and furnaces, at regular



AT Lower Left Are the Motors Driving the Two Fuller-Kenyon Pumps. On the platform are the two 48-in. standard Fuller-Lehigh pulverizing mills, each driven by a motor of 125 hp.

pressure and is introduced at the rear end of the burners. Burners with combined secondary air are installed on the hand-fired heating furnaces and are inserted in the end walls of the existing combustion chambers.

In the regenerating gas furnaces the existing air checker chambers are retained, with the exception of the checker bricks, which have been removed. With this scheme, comparatively high-temperature air is provided as secondary air and enters the furnaces over the bridge walls, as usual. The regenerating furnaces are equipped with two burners, one at each end, which operate in conjunction with the reversing of the secondary air.

The method of supplying the regenerating furnaces with coal through either burner, without using a storage bin at each end of the furnace, is accomplished by inserting a Fuller-Lehigh switching valve on the 4-in. transport line, between the screw feeder and the two burners.

Importance of Technical Details

Application of burning pulverized coal in two different types of heating furnaces for heating slabs weighing 150 lb., for the manufacture of blue annealed steel sheets, and slabs and ingots weighing 11,000 lb., for the manufacture of boiler plates, is accomplished only by carefully preparing the pulverized coal and the use of suitable burner equipment. It was found important

intervals, are compulsory. Consequently the interior of the coal plant and the equipment at the furnaces usually presents a clean appearance. Clean brick and cement floors, clean and orderly mills and machinery, are necessary safeguards against dust explosions and fires.

Pioneering in Powdered Coal

Application of powdered coal to the different types of re-heating furnaces under varying conditions, together with the wide range of steel slabs and ingots heated, are the pioneering features of this installation. It is felt that the installation has been made possible only by improvements in the machinery for the pulverization of coal.

Powdered coal, like other developments, is a process of evolution and improvement covering many years. The accomplishment of this company only marks another step in the ultimate development of what it is safe to predict will be a wider application and more extensive use of this fuel.

Without indulging in prophecy, it might be suggested that powdered coal, due to some further development and refinement, may some day be transported for long distances by relaying pumping stations. This may change the economic situation of low-grade, unprofitable coal-mining districts by utilizing this fuel in industrial centers. Its use for domestic heating purposes, also, would not seem improbable.

The Danger Line and the Color of Ink

Steel Companies Have Their "Critical Production" Quota

Above or Below Which Profits or Losses Ensur—

Effect of More Orders at Lower Prices

BY LEON CAMMEN

THERE is a story going around in the steel business to the effect that a certain prominent capitalist who owned a mill that did not pay commissioned a consulting engineer to find out what the trouble was. The engineer made his report in due time, and among other things remarked that in looking over the stockroom he found seven bottles of red ink and one bottle of black. "Do you know what the bottle of black ink was for?" the capitalist asked.

In some branches of the steel industry the demand for red ink ought to be quite strong. "Over-capacity" does not seem to explain existing conditions, because even the sheet mills, which seem to be hardest hit, have been working at 90 per cent. Neither does talk about the "ruthlessness" of buyers explain the situation. If a purchasing agent can buy for 1.95c. per lb., he would be remiss in his duty to his employer to pay 2c. It is not the business of a purchasing agent to subsidize national industries from the pocket of his employer. In fact, if this kind of talk goes on, we may expect to see a McNary-Haugen bill for steel relief introduced in Congress. The following remarks, may, however, offer some explanation:

"Danger Line" for the Steel Corporation

We are dealing here with rather rough figures, and therefore, for the sake of argument, we shall assume that all the profits of steel companies come from rolled goods, although actually, especially in the case of the United States Steel Corporation, to which we shall refer specifically, this is of course not so. Such an assumption will, however, help to make our course of reasoning clearer.

Now, on an average, for the last seven years the Steel Corporation has been producing some 11,500,000 tons of rolled products per year, except for the year 1921, when it made only 7,500,000 tons. The fact that in that year the corporation practically broke even would indicate that 7,500,000 tons of rolled goods per annum is the corporation's "danger line," that is, it is the minimum production which, in addition to direct manufacturing costs, can take care of all other standing expenses such as overhead, taxes, depreciation, etc. Had the corporation made less than this critical amount, it would have to begin buying red ink. In years when it produced more, it had money for plant improvement and dividends.

When, therefore, the corporation makes a profit of say \$70,000,000 on a production of 11,500,000 tons, the first 7,500,000 tons merely pays for itself and carries the burden of standing charges (or its dominant part at least), and it is only the last 4,000,000 tons that earns a profit. By this reasoning, then, the profit on the last 4,000,000 tons is at the rate of \$17.50. The figures may not be right, in view of the assumptions which we have made, but the fact is there, and this is that the production above the "danger line" level is what is making the big profits.

"Danger Line" for a Smaller Company

Let us now consider, however, the case of a company making say 1,000,000 tons of goods per year at a little profit. Let us assume that its "danger line" lies at 900,000 tons, and the profit on the last 100,000 tons is at the rate of \$8 per ton. The company is then making a net profit of \$800,000 per annum, and more

than one reader will be able to name one, or more than one, company which is approximately in the position here described.

And now comes the tragic part of the story. The management dimly realizes that it is the last 100,000 tons that has been making the stockholders smile, and tries to make it 200,000 tons instead. Unfortunately, steel products are sold on specifications, so that superior salesmanship and claims of superior quality will not sell another 10 per cent of production. There is only one powerful argument that will sway the purchasing agent, and that is price, and so prices are slashed a little, say \$1 a ton.

Let us see what happens. An extra 100,000 tons of business is secured, at a profit of \$7 per ton, however, instead of \$8, because of the \$1 cut in quotations, and this brings in \$700,000 in the course of a year, which would have been fine except for the fact that a dollar cut on the original 1,000,000 tons costs the company \$1,000,000. The result is that the company did 100,000 tons more business, and made \$300,000 less money.

And this is exactly what has been happening to all but a few companies, assuming that there have been any exceptions at all. Price cuts have in most cases secured more business, proof of which is that most of the sheet mills, for example, have been operating at 90 per cent capacity, but in practically every instance the increase in business thus secured has not been sufficient to compensate for the loss of revenue due to the lower quotations.

Two Remedies Offered

What is the remedy? There are two of them; one, education, and the other, time. Education of steel mill executives is needed to show them that it does not pay to sell at a loss or no-profit. At first glance, one would be inclined to think that men operating such important plants as steel mills ought to know such a simple thing as a matter of course, but the trend of facts would indicate that they do not. Those whom education does not help will be probably helped by that great healer of all ills, Father Time.

The trouble is that many of the mills have survived the war and first post-war years with too much money, and think that they can afford to lose some of it in order to hold and get business. Proof of this is that while operations have been decidedly unprofitable in a number of cases, there has been a most gratifying lack of failures among steel makers, which shows that those who have been losing have been thus far losing their own money and not that of their creditors. This money is not going to last forever, however, and when it is exhausted the unreasoning price-cutters will be automatically eliminated, and a better state of trade may then be inaugurated.

In the meantime, it would pay each company to know where its "danger line" is located.

The Holslag patents, held by the Electric Arc Cutting & Welding Co., Newark, N. J., covering alternating-current arc welding apparatus, and inductive reactor A.C. patents known as the Arendt patents, owned by the Owen Electric Mfg. Co., Fayetteville, N. C., have been consolidated into one license arrangement, and various plants making A.C. machines have negotiated for licenses under the new agreement.

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Suggests Annealing for Welded Pip

Tests on Water Supply Pipe Show Weakness in Zone
Alongside Joint, Having Grain Coarsened by Weld-
ing Heat—Treatment of Plates in Manufacture

BY J. L. AVIS*

DURING the past year, considerable publicity has been given to electric arc welding of structural steel, and of plates for tanks, penstocks and water supply pipe, the major portion of which has emanated from the welders themselves and the manufacturers of welding apparatus. Much has been told about the time saving and noiseless construction, and claims have been made that the welds develop the full strength of the original plates, as evidenced by test specimens breaking outside the welds. But a most important phase of the situation, and one which does not seem to have received all the detailed study and investigation which it deserves, concerns the physical condition of the weld itself and the metal adjacent thereto. Is this metal, at the location of the fracture, unharmed and in its original condition?

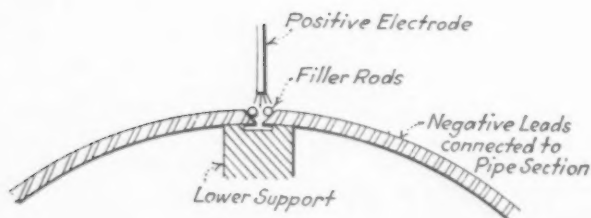
what, if anything, could be done to improve them. The information in this paper is derived from these tests.

Method of Manufacture

It will be well to describe briefly the method whereby bulky steel pipe, which cannot be shipped the long distance across the continent, is made locally of flat steel plate.

In the construction of fusion welded pipe lines of say 28 to 36 in. diameter, plates of from $\frac{1}{4}$ to $\frac{1}{2}$ in. thickness are generally used, purchased under American Society for Testing Materials specification A78-23T as "plates of structural quality for forge welding." Chemically these range between 0.15 and 0.22 per cent carbon, between 0.35 and 0.65 per cent manganese, with not over 0.06 per cent phosphorus and 0.05 per cent

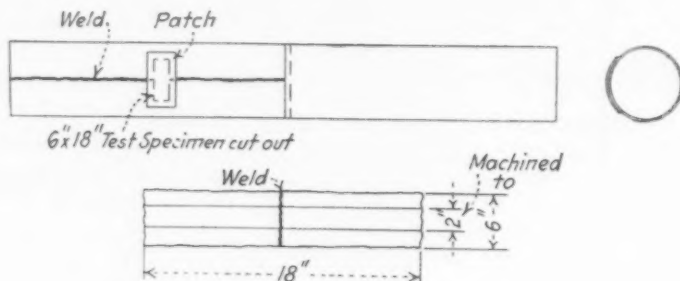
(Below) Fig. 1.—Sketch Showing How Filler Rods Are Used to Increase Rate of Deposition of Metal in Single Vee Seam



Last year, one of our Western cities placed an order for several miles of electric arc welded pipe, approximately six hundred sections. Hydrostatic tests of all sections were specified and made, and during these tests, many sections (approximately 20 per cent) broke at the welds, some for only a few inches and others for several feet. The testing pressure was 210 lb., the diameter of pipe 32 in., and it is the writer's understanding that the line was designed for a head of slightly over 300 ft. (which is equivalent to a pressure of 130 lb. per sq. in.) Sections which burst were chipped clean of weld metal and re-welded, and if no further leaks developed under re-test were accepted by the inspector representing the purchaser.

At about this time, the city engineer of another of our Western cities received quotations for his pipe line and was greatly surprised to find a lower price for electric welded steel pipe than for creosoted wood stave pipe. Having heard that many sections of the first mentioned pipe burst at the welds when subjected to the hydrostatic tests, this engineer in letting the work arranged for adequate inspection and some tests on the completed pipe, in order to have first hand information as to the physical condition of these welds. If these were not all to be desired, he wanted to know

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(Above) Fig. 2.—Method of Cutting and Preparing Test Specimens

sulphur. Two grades are used, grade A with a minimum of 45,000 lb. per sq. in. tensile strength and 28 per cent elongation in 8 in., and grade B with a minimum of 50,000 lb. tensile and 25 per cent elongation. For the particular pipe line under discussion, the mill tests on the plate were reported to be

Yield point, 33,700 lb. per sq. in.
Tensile strength, 54,600 lb. per sq. in.
Elongation, 31.5 per cent in 8 in.

thus representing first quality material.

These plates are usually furnished to the fabricator cut very nearly to exact size, so all that is necessary is to bevel-shear the edges and bend them to required diameter. These are next placed in the electric arc welding machine, two welding rods are placed parallel to each other and in the V formed by the two edges of plate, while a third welding rod is held in the traveling head of the machine. When welding an intense heat is created in the plate owing to the combination of low voltage and high amperage in the current—the welding rods (both positive metal electrode and the two filler rods) are melted, and one observes the metal is molten and bubbling with gases for from one to two inches behind the focus of the arc. Obviously, then, this steel plate is held together at the joint by a narrow strip of metal, which is of the nature of a casting, and physi-

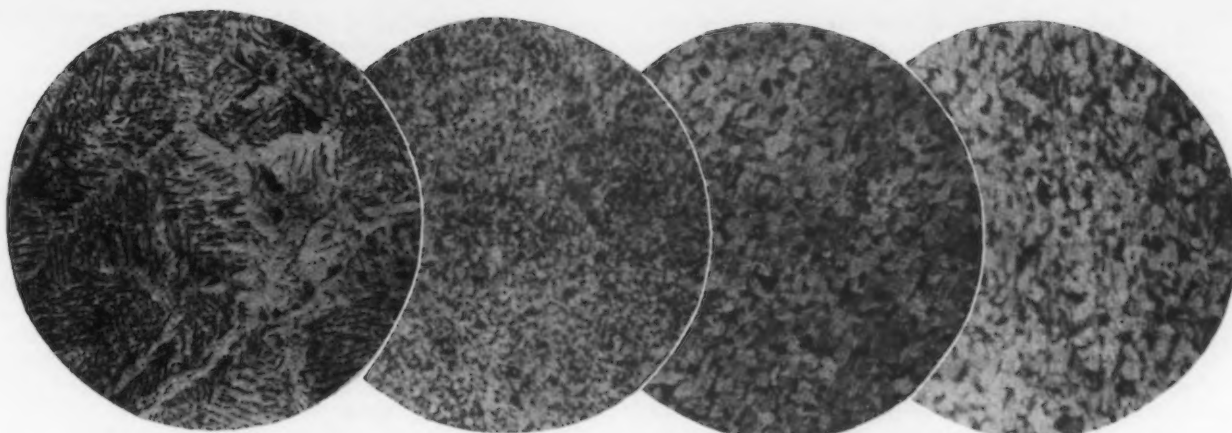


Fig. 3

Fig. 4

Fig. 5

Fig. 6

Typical Microstructures of Electric Welded Plate. Magnified 150 dia.

Fig. 3.—Cast Material at Center of Weld. Fig. 4.—Plate $\frac{1}{8}$ in. from center. Fig. 5.—Plate $\frac{1}{4}$ in. from center. Fig. 6.—Plate $\frac{7}{8}$ in. from center of weld

cally and chemically must be of a very different character from the plate which it binds together. Furthermore, this narrow strip of casting must cool rapidly, for, while the plate immediately adjacent to the filler rods attains a high temperature, the large bulk of metal on both sides of the weld absorbs the heat so rapidly that the molten metal of the weld is chilled down far below its lower critical range in a very few minutes.

Tensile Tests on Welded Sections

In order to determine the gross effect of the complex chemical and physical reactions which are involved in this method of manufacture, 6 by 18-in. test specimens were cut from the weld in every tenth pipe section, as shown in the sketch. This was done before the hydrostatic tests. To close the hole, a rectangular patch was laid over, and edge welded all around. The test specimen was then straightened out, and machined to a 2-in. strip with parallel edges, but none of the excess weld metal was removed. This piece was then pulled in tension.

Typical results of these tension tests are given in the table. They gave an average yield point of 29,100 lb., an average tensile strength of 44,300 lb., and an average elongation in 8 in. of 9.3 per cent. As compared with the mill tests, these indicate a yield point efficiency of 86 per cent, a strength efficiency of 85 per cent, and a ductility efficiency of 30 per cent.

Some allowance should be made in interpreting these efficiencies, as the welds run longitudinally to the length of plates and hence, specimens as cut from the welds are transverse test pieces in respect to the plate material. The writer has not the information as to what extent of rolling in both directions these plates received at the mills. It is generally conceded that transverse tests on plates will show a loss in tensile

strength ranging from 2 to 5 per cent, and in the few tests which were made on transverse specimens in this investigation this was very clearly brought out. Another factor is the rapid speed of the testing machine in most routine tests in the mill. This would tend to give high values. However, a number of tests were made from crop ends of these plates, which showed

Tensile Properties of Welded Specimens

No.	Yield Point	Tensile Strength	Elongation in 8 In. Per Cent	Fracture
7	27,920	43,290	12.50	Silky $2\frac{1}{2}$ in. from weld.
12	31,080	45,310	4.68	Granular through weld.
14	28,750	44,470	4.68	Granular through weld.
18	27,680	41,820	10.93	Silky 2 in. from weld.
21	33,140	45,080	4.68	Granular through weld.
26	28,160	44,070	17.19	Silky 2 in. from weld.
27	27,440	42,310	5.47	Granular through weld.
29	28,880	43,170	3.13	Granular and gas pockets.
32	28,020	42,890	15.62	Silky 3 in. from weld.
36	27,560	44,260	4.68	Granular through weld.
39	29,310	45,300	12.50	Silky 2 in. from weld.
40	28,730	43,690	15.62	Silky $2\frac{1}{4}$ in. from weld.
43	27,460	43,490	5.47	Granular through weld.
44	28,990	43,680	12.50	Silky $2\frac{1}{4}$ in. from weld.
49	33,620	52,180	10.93	Silky $3\frac{1}{2}$ in. from weld.

no more variation from the mill tests than would ordinarily be expected.

Consequently, after making every allowance for these factors, it is clear that the welding process has reduced the strength and ductility of the original plate.

Now let us take a look at the structures disclosed by the microscope. Fig. 3 is taken $\frac{1}{8}$ in. from the fractured edge of one of the welds which broke at the center of the weld, and is the typical structure of the "cast" or weld metal in the majority of cases examined.

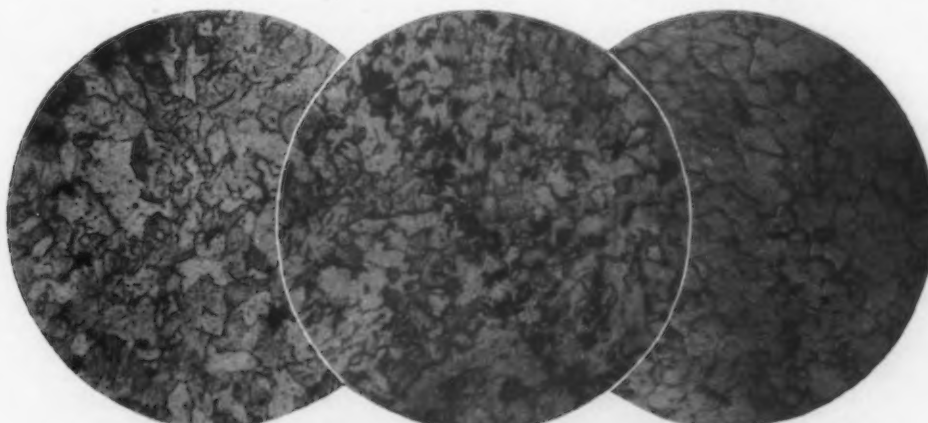


Fig. 7

Fig. 8

Fig. 9

Electric Welded Plate After Annealing. Magnified 135 dia.

Fig. 7.—Cast Material at Center of Weld. Fig. 8.—Contact between weld metal and plate. Fig. 9.—Plate $\frac{7}{8}$ in. from center of weld

It is the belief of the writer that the pronounced acicular structure is mainly due to iron nitride.

The structure of the plate itself $\frac{1}{8}$ in. from the center of weld is shown in Fig. 4, disclosing a minutely fine crystalline structure, while at $\frac{1}{4}$ in. from the center of weld a much coarser structure is found, as shown by Fig. 5. It is in this region that internal stresses are produced by the heat and where many test specimens break.

At 7 in. from center of weld, Fig. 6, we see the normal structure of the plate, namely, fairly uniform crystals of ferrite and areas of pearlite.

Results of Normalizing

Years ago, specifications governing the fabrication of structural grade steel stated that, when necessary to heat a member for bending purposes, the entire member must be subsequently annealed. It is doubtful if the writers of these specifications knew the real reason for this stipulation. They did know that frequently members heated for bending without subsequent annealing failed in service. It is common knowledge now that structural grade steel is crystalline in structure and that certain heat treatments have a profound effect upon the crystal size and arrangement of the constituents, which in turn have much influence on such physical properties of the metal as ductility, elasticity, tensile strength and hardness.

When part of a structural member is heated sufficiently to produce crystal growth and the remaining part has had no crystal growth produced by heating, a physical condition is created which results in internal stresses. This condition exists in all welded material as welded and may be effective anywhere within five inches of the weld, depending somewhat upon the thickness of the metal welded, and the intensity of the heat. In the opinion of the author these stresses are very high in many instances, as is evidenced by the fact that those specimens in this series which broke outside the welds are much below the strength of the original plate as rolled. Obviously, then, as a first step toward the elimination of these internal stresses and an improvement of the structure of the weld itself, some form of heat treatment suggests itself.

To determine the effect of heat treatment, the usual test strips were cut from the welded plates. These were brought up to 1580 deg. Fahr. in 90 min., held for one hour, allowed to cool to 800 deg. Fahr., removed from the furnace and cooled to room temperature. The average yield point thus obtained was 31,300 lb. per sq. in., a tensile strength of 50,900 lb., with 22.65 per cent elongation in 8 in. and nearly all fractures in the welds. This constitutes a marked improvement over the specimens tested as welded.

For direct comparison of the structures, Fig. 7

shows the same area as Fig. 3. A very remarkable transformation is apparent. There still remains, however, some slight evidence of the former iron nitride needles of the original "cast" or weld metal. Fig. 8 shows the "line of demarcation" between the cast or weld metal on the left half, and the original plate on the right half. A much more uniform crystalline size is certainly disclosed. The dark patches are due to oxidized metal carried against the original plate by the flow of the molten weld metal and entrapped there when the metal solidified. The central inclusion is slag. This adds weight to the statement that electric arc welds do not develop the strength of the original plate.

These test figures and microsections speak for themselves as an argument for annealing electric welded pipe for important services. It is to be expected that, when it comes to suggesting a suitable heat treatment for welded materials, we are bound to encounter opposition. Thirty years ago, much opposition was encountered when it was advised to anneal all important steel forgings. Fifteen years ago foundries disliked the idea of annealing steel castings.

The main objection will be based on the added cost of fabrication. This should not be a consideration, for if the designer or purchaser of a welded steel pipe line desires a sound, serviceable and dependable material, he should be satisfied to pay for the cost of producing such a line, and should be given all the facts and reasons for any unexpected costs. No doubt there arise cases where electric arc welded material can be safely used as welded and without any normalizing process; for example, for dredging operations and supply lines of small diameters and operating under very low heads and small stresses. However, many towns and cities bring their water long distances from high altitudes in such lines, and none of them is entirely free from the peril of water hammer. If suitable heat treatment will greatly increase the safety factor, why not do just that?

To the writer, an electric annealing furnace with pyrometer control lends itself most readily for this operation, and with suitable rolls for restoring the contour of any sections which might warp a little during heat treatment, would constitute the entire additional equipment necessary. Pipe taken from the annealing furnace could be immediately run through the "contour-restoring-rolls" and thence to the coating tanks, the residual heat eliminating the present pre-heating furnaces used just prior to dipping.

Electric arc welding is one of the most recent additions to fabricating industry. It is a valuable addition and has come to stay. It behooves the industry to develop its latent possibilities and adopt such processes as will produce sound and dependable workmanship.

MORE ALIENS ARRIVE

Net Increase in Population Was 284,493 in Fiscal Year—Record Number Deported

WASHINGTON, Aug. 22.—Total admissions of aliens to the United States during the fiscal year ended June 30, 1927, were 538,001. Alien departures during the year numbered 253,508, of which 73,366 were emigrant and 180,142 were non-emigrant, resulting in a net increase in the alien population of the country of 284,493, as compared with 268,351 for the fiscal year 1926. In June 40,359 aliens, 24,000 immigrant and 16,359 non-immigrant, were admitted.

Over 88 per cent of the 335,175 immigrant newcomers during the year came from ten countries: Canada, contributing 81,506 immigrant aliens, led the list, followed by Mexico with 67,721; Germany, 48,513; Irish Free State, 28,054; Great Britain, 24,160; Italy, 17,297; Poland, 9,211; Sweden, 8,287; Norway, 6,068; and France, 4,405. While the permanent immigration addition for the year just ended shows an increase of 30,687, or 10 per cent, over that for the previous year, when 304,488 immigrants entered the country, the bulk of this increase came from only two countries, Mexico and Italy.

Commissioner-General Harry E. Hull calls attention to the fact that a record number of deportations was registered during the fiscal year 1927, a total of 11,662 aliens having been deported from the United States under warrant proceedings. This is an increase of 758 or nearly 7 per cent over the previous high-water mark of 10,904, reached in the fiscal year 1926. Due to an insufficient appropriation there was a sudden drop in the deportations during the latter part of the past year. The principal causes for deportations in 1927 were: Entering without proper visa, 5,464; criminal and immoral classes, 1,525.

Less than a third of the aliens admitted last year were charged to the quota, 158,070 of the 538,001 total admissions in 1927 coming in as quota immigrants. Practically all of the European countries exhausted their quotas during the year.

Iron and steel workers entering the United States during the fiscal year 1927 totaled 2,380, against 193 workers of this class who departed. The number entered during the fiscal year 1926 was 1,469, while departures numbered 120. Machinists entering and departing during the fiscal year 1927 were 2,143 and 511, respectively, while the number of this class of workers entering and departing during the fiscal year 1926 were 2,038 and 557 respectively.

MURALS AT NORTON PLANT

Paintings in Assembly Hall of Worcester Works Trace Manufacture of Abrasives

AN assembly hall at the main plant of the Norton Co., Worcester, Mass., has been made a sentimental as well as a practical center of the activities of that organization. In it much more than ordinary attention has been given to the history and traditions, personal and industrial, of Norton men and the products they have developed and manufactured. Most important are memorials to the men who served in the World War and tributes to those who have rounded out a quarter of a century of service to the company during its growth from an extremely modest beginning to its present position, with works at Worcester, Mass., and Hamilton, Ont., and in France and Germany.

The final touch has been given the hall by the setting in place of a series of mural panels. Paintings in warm color, they tell the story of the company's abrasive products, from the bauxite mine to the finished wheel in commercial operation. They are the work of Arthur Covey, president of the National Society of Mural Painters, who has won international fame for paintings of this character. While his murals at Worcester are in no sense impressionistic in character,

they have sufficient vividness of color to bring out the striking contrasts their subjects furnish.

The paintings are 11 in number, five on either side wall and one in a space at the rear of the rostrum. The last named picture shows a tree representing the company's history. Along the trunk are painted the dates of erection of the Norton buildings. On the roots are the names of the members of the first board of directors, and on the branches the names of the many 25-year men, whose loyalty is thus honored.

The other paintings deal with the manufacture of abrasives. They show the mines, electric furnace plants, the various departments in the production of wheels—mix, pressed wheel, kiln, truing and packing—and finally a scene in a shop where the wheels are in commercial operation in Norton grinding machines, beside which is finished work.

The murals are set above a line of exhibit cases, the contents of which amplify in detail the story told by the pictures. The cases contain specimens of materials used in the company's products, grinding wheels in the several stages of manufacture, and many types of finished wheels and refractory and floor products. Finally, there are samples of work done by grinding wheels, embracing a wide range of articles, including parts of automobiles and machine tools.

In this atmosphere, full of significance, Norton people hold their meetings. Here, too, visitors are taken to give them an initial impression of the scope of grinding wheel manufacture.

GRINDING Wheels (at Right) in Grinding Machines in Use in a Machine Shop

MURAL Panels (Below), Supplemented by Exhibit Cases, Tell the Story of Abrasives from the Mining of Bauxite to the Use of Grinding Wheels in Shop Operations



DIAL FEED TAPPER

Three Operations Combined in One in Machine With Automatic Screw Inserting and Staking Devices

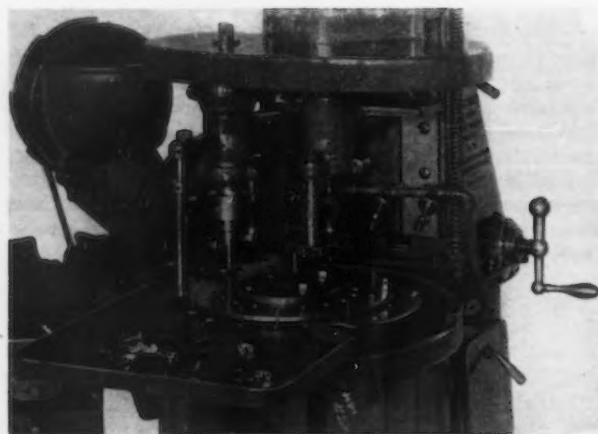
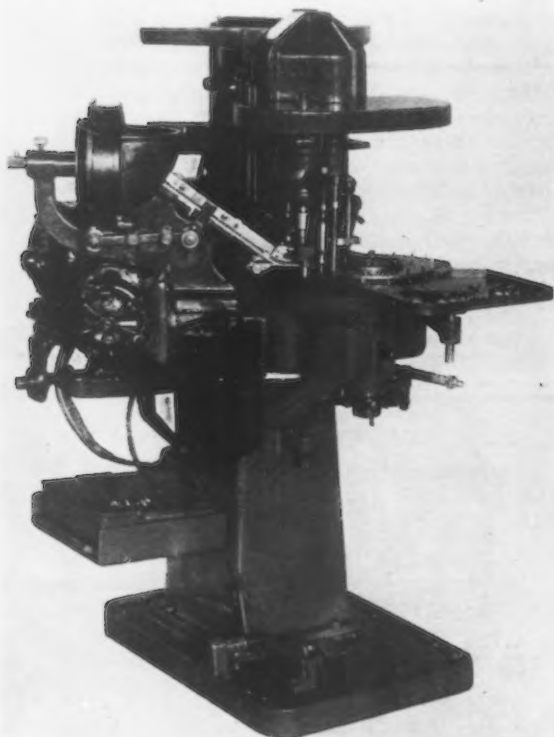
AUTOMATIC screw inserting and staking devices are features added recently to the dial feed tapping machine of the Anderson Die Machine Co., Bridgeport, Conn., previous models of which were described at length in *THE IRON AGE* of Jan. 26, 1922, and Aug. 8, 1923.

The company explains the purpose of these added features as follows: "In the manufacture of electrical

(either in the same plane or in a different plane), insert the screw and stake the end, all in one operation at a speed of 40 to 45 pieces per min. The one operation is now done at a rate exceeding any one of the three operations performed singly."

The hopper is designed to feed screws from a No. 3 to No. 10 by a simple adjustment of the chute rails. It operates directly from the machine, no separate source of power being required. The screw is transferred positively from the chute rails into the transfer fingers that centralize the screw head with the screw driver, these transfer fingers also carry the screw from the level of the chute rails into the tapped hole on a lower level.

The screw driver is provided with a friction clutch device, through which the torque exerted by the screw



*Dial Feed Tapper Equipped for Simultaneously
Tapping, Inserting and Staking Screws in Con-
tact Blades for Separable Plug Caps. Production
is said to be at rate of 50 pieces per min.*

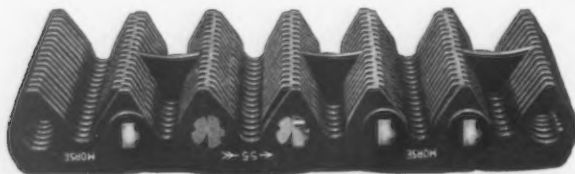
wiring devices it is necessary to insert binding screws for the purpose of connecting the wires, these screws being riveted over or staked on the end after being inserted. Heretofore such parts have been tapped in one operation, the screw inserted in another, and the end staked over in a third operation. These three operations have been combined into one by the development of a hopper for feeding the screw automatically, a screw driver that will drive the screw to desired tension, and an automatic staking tool, which is arranged to give a uniform blow regardless of variation in length of the screw. All these mechanisms have been incorporated in the machine here illustrated, which is arranged so that it can tap one, two or three holes

driver can be adjusted to suit requirements. The bit which engages the slot, together with the centralizing sleeve, can be changed to suit heads of various diameters and shapes. It is claimed that because of the positive separation of the friction clutch the screw driver will not burr the slots in the screws. The staking tool is arranged so that the blow can be regulated to suit requirements. The work is automatically ejected from the dial upon completion.

It is stated that the machine is not a single purpose unit, in any sense of the word. The dials are complete units for any work to be tapped, and are arranged so that the staking tools are fixed in proper relations to centralize with the screw.

Improves Rocker Joint in Transmission Chain

Change in design of the rocker joint is a feature of an improved No. 55 type chain announced recently by the Morse Chain Co., Ithaca, N. Y. The new link



*The Seat Pin Has Been Enlarged to Give
Greater Bearing Surface*

being the same length and height as the old, the improved chain will run on all sprockets as heretofore.

The new joint operates on the same principle as the original Morse rocker joint, but the seat pin has been enlarged to give greater bearing surface and also to provide a stronger transverse member. The rocker pin has been changed in contour to give better contact surface with the links. The combined joint members are said to give a more nearly round hole with reduced clearance, holding the links more securely on the pins. It is stated that the new joint is better balanced and heavier than the old, and that it produces a smoother running chain. The joint pins are about 8 per cent heavier, and the complete chain weighs twice the pitch per inch foot. The braking strength is said to have been increased about 50 per cent.

Sheet Leveling Rolls With Automatic Features

New type unit head sheet leveling rolls recently placed on the market by Kane & Roach, Inc., Syracuse, N. Y., are shown in the accompanying illustration.

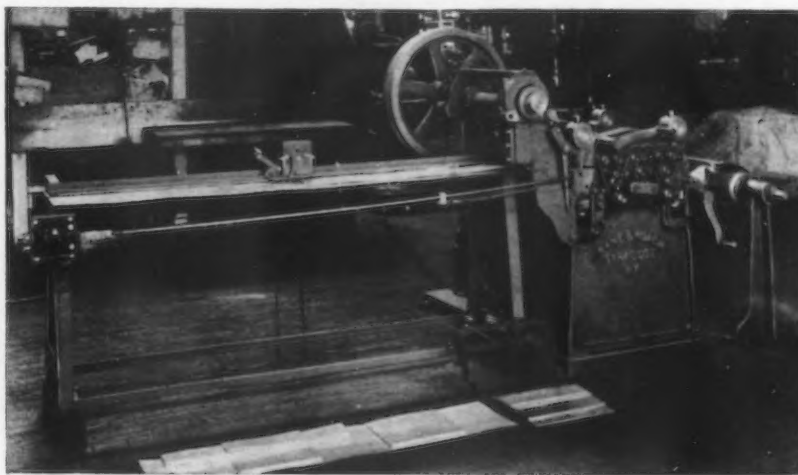
The machine is available in several sizes, with rolls varying in number, diameter and width, to meet specified conditions. Automatic cut-off shears, delivery table or automatic dumping tables can be furnished also, if desired. The unit here shown is the 12 roll sheet leveler, designated as the No. 103, handling aluminum sheets 16 in. wide, 0.006 in. to 0.0040 in. thick, from the coil. Material cut to lengths is said to be handled equally well on the machine.

The rolls, 12 in number, are of high carbon steel and accurately machined and ground to size. The lower six rolls, which are stationary, are driven by cut steel gears, and the upper six rolls are mounted in a unit head, which is adjustable at both the feed and the delivery end. In addition, the first and the last of the upper rolls are mounted in eccentric bearings, so that they may be adjusted individually in addition to the unit head adjustment. When desired, as many of the upper rolls as required can be provided with this individual adjustment.

The six upper rolls are driven by means of two hardened steel roller chains, arranged as shown in the illustration. Sufficient adjustment is allowed in the chains to provide for ample adjustment of the unit head. Each chain is provided with a take-up sprocket mounted on a lever, which is attached to a spring, so that slack in the chain is taken up at all times. Among the claims for this type of drive is that it is smoother

and less expensive than the spindle type, and requires less room. The Bowen automatic oiling system is employed for lubricating all of the lower roll shaft bearings.

The shear is of standard fly-wheel type and in the installation here illustrated, it is required to cut automatically in lengths from 10 in. up to any length desired, within a tolerance limit of plus or minus 1/32 in. An electric switch and solenoid (furnished by the Cutler-Hammer Mfg. Co.), serves to automatically



The Upper Rolls Are Mounted In a Unit Head, Which Is Adjustable at Both the Feed and Delivery End. The Sheets Are Cut to Length Automatically

trip the shear. This arrangement in connection with an adjustable, positive stop gage shown with the electric switch on dumping table is said to provide high accuracy in cutting. It is claimed that the machine will deliver the stock at a speed of 75 ft. per min. A 5-hp. motor drives the leveling rolls and the shear.

Wheel Truing Attachment Widens Use of Surface Grinder

Accurate and economical shaping of abrasive wheels used on its No. 2 surface grinding machines is claimed for the radius and angular wheel-truing attachment here illustrated, which has been brought out by the Brown & Sharpe Mfg. Co., Providence.

With this attachment, both convex and concave outlines having radii varying from 0 to 1 in., and face



Attachment in Use Shaping a Radial Contour on the Periphery of the Surface Grinder Wheel

angles up to 90 deg. either side of zero, can be formed. A number of combinations of radial and angular shapes, otherwise difficult to obtain, can also be developed conveniently. The attachment is said to be particularly desirable when grinding lamination dies, flat forming tools, and miscellaneous pieces of circular or angular form.

The attachment uses a diamond tool which is clamped in an upright post on a movable slide. The slide is graduated for fine adjustment and can be locked in position by means of a clamping screw. A gib and adjusting screws provide the means of compensating for wear. The slide is carried in a swivel which pivots on a hardened steel stud and can be securely clamped in any position desired. The base upon which the swivel is mounted is graduated to 90 deg. either side of zero.

Convex and concave shapes are secured by clamping the slide at the desired radius and swinging the swivel through an arc sufficient to develop the full outline. Angular faces are obtained by clamping the swivel at the desired angle and then passing the slide back and forth by means of the handwheel, the diamond tool being held in the diamond tool holder at right angles to the slide. The center line of the abrasive wheel is brought to the same height as that of the diamond tool in all cases.

Two bolts, which pass through the base and fit the table T-slots, serve to hold the attachment on the machine table. A raising block, to which the attachment is bolted when a magnetic chuck is used, is available as an extra. The weight of attachment is 26 lb.

Retail food prices July 15 are reported by the United States Bureau of Labor Statistics to have dropped about 3 per cent from June 15, and about 2 per cent below July 15, 1926. They record an increase of 53.4 per cent since 1913.

48-IN. TILTED OFFSET MILLER

New High Production Unit for Face or Straddle Milling, etc., of Small Parts

SMALL parts are milled on a high production basis by the tilted offset milling machine here illustrated which will be exhibited for the first time by the Oesterlein Machine Co., Cincinnati, at the exposition to be held by the National Machine Tool Builders' Association in Cleveland, Sept. 19-23. The machining is by



Tilted Offset Milling Machine. A feature is the heavy spindle and spindle mounting, shown below. The table worm and worm wheel are located close to the working surface of the table. The worm wheel is almost as large in diameter as the table



a process known as offset milling, which, it is claimed, may be applied to advantage in such operations as face or straddle milling of small parts, the milling of flats, slots and saw cuts. The production advantage of the offset process is said to be due to the fact that a number of parts are under cut simultaneously. The machine consists of a tilted circular table having a large center hole, and a spindle mounted beneath and at right angles to the working surface of the table. A 4-in. offset adjustment is provided for the table so that the center line of the table and that of the spindle may coincide for the removal of the circular or hollow circular work-holding fixtures, or the center lines may be offset the distance required to obtain the proper depth of cut.

The spindle is mounted in a slide which is bolted to the housing that carries the table, thus confining the strains of the cut within a single completely inclosed, heavily reinforced ring of metal. The same

housing which carries the table and spindle also carries the support that forms an outboard bearing for the arbor. The spindle may be adjusted vertically so that the final setting of the cutters in relation to the work can be obtained. The spindle adjustment and the spindle housing clamps are operated from the front of the machine. A 2-in. vertical adjustment is provided.

The heavy spindle and spindle mounting may be noted from the separate illustration. The large Timken bearing is $8\frac{1}{2}$ in. in outside diameter. The spindle is driven by a worm wheel of 15 in. pitch diameter which floats on the spindle, being carried in the bronze bearing shown in the illustration. The purpose of mounting the spindle below the table is to bring the drive as close as possible to the nose of the spindle and to permit of removing arbors or cutters without disturbing the vertical setting. The table worm and worm wheel are located as close as practical to the working surface of the table, and the worm wheel is almost as large in diameter as the table.

The table is 30 in. in diameter and is mounted in a tilted position in order to shed the 40 gal. per min. of coolant and to prevent splashing of the coolant outward. It permits washing away of the chips and prevents their accumulation on the table and fixture. The chips are washed from the table into a cavity in the base of the machine from which they may be shoveled out. The coolant drains from the chips into a reservoir.

The machine swings 48 in., and takes 14 in. between the table and the top of the housing. Speed and feed changes are obtained by means of pick-off gears. A 10-hp. motor is recommended for driving the machine to its capacity. The net weight is 7000 lb., and the floor space occupied by the machine is 25 sq. ft.

Light Weight Steel Cart Wheels

Light weight, as well as strength, are features claimed for a new built-up steel pushcart wheel which is being manufactured by French & Hecht, Davenport, Iowa. In this design the steel spokes are forged, while hot, into the hub and have heads formed on the inside of the hub, with shoulders on the outside. This is said to produce a spoke fastening similar to that of a boiler rivet. The spokes are firmly headed and shouldered into the tire. The tire is $\frac{3}{8}$ in. thick, is grooved for the spoke heads and is flanged, the leg of the flange being $\frac{1}{2}$ in. high.

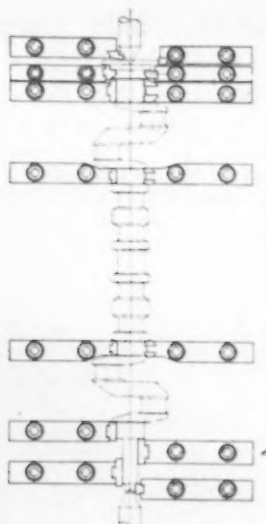
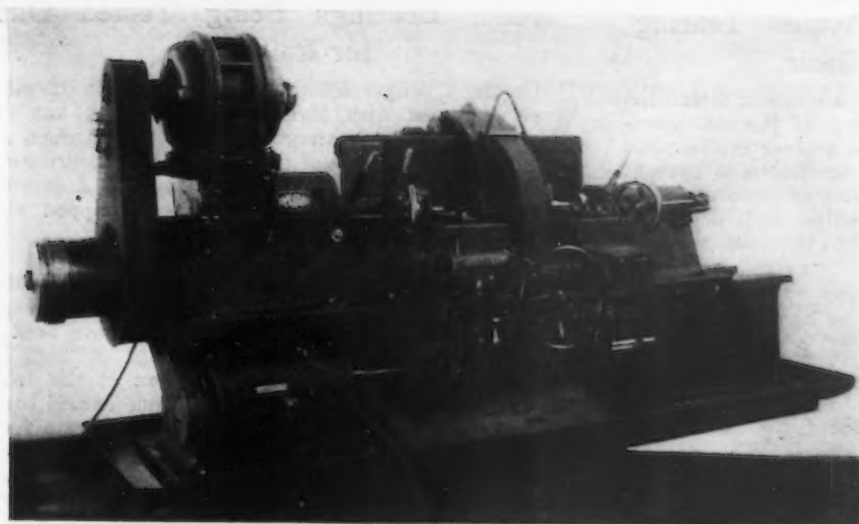
The barrel cart wheel here illustrated is 36 in. in diameter and has a tire 2 in. wide. There are ten spokes, each of which is $\frac{3}{8}$ in. in diameter. The axle hole through the cast-iron hub is 1 in. in diameter and 5 in. long. This wheel, which weighs only $17\frac{1}{2}$ lb., is said to carry safely a load of more than 600 lb.

Added strength with but little weight is said to be gained by having the edges of the tire flanged inward



The Spokes Are Forged into the Hub, Heads Being Formed on the Inside and Shoulders on the Outside

and a groove near the middle. The groove gives additional stiffness to the tire and at the same time provides protection for the spoke heads.



The Machine Is Arranged to Hold the Crankshaft on Anti-Friction Live Centers and to Drive From the Center Bearing. The layout of tooling on a 5-bearing 8-throw crankshaft is shown at right

Semi-Automatic Center-Drive Crankshaft Lathe

High production is claimed for the 34-in. semi-automatic crankshaft lathe here illustrated, which has been added recently to the line of the Wickes Brothers, Saginaw, Mich.

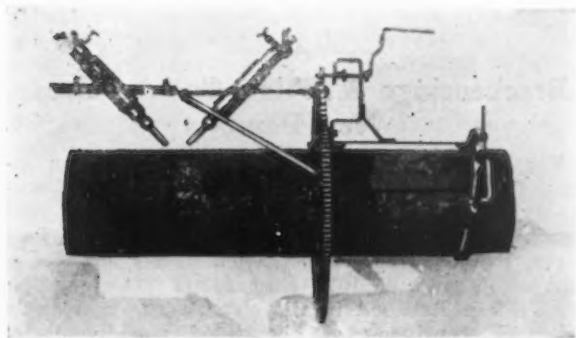
This machine is arranged to hold the crankshaft on anti-friction live centers and to drive from the center bearing, which has been previously machined. The drive is by means of a herringbone gear which is clamped securely to the center bearing. The lathe cheeks, turns and fillets the front bearings, the front end of the crank, the rear bearings, oil grooves and flange. The set-up in the illustration is a three-bearing, six-throw crankshaft, while the layout of tooling

shown in the separate illustration is for a heavy, five-bearing, eight-throw crankshaft. The cross-slides are arranged so that the tooling may be changed conveniently for machining different cranks in the same lathe.

In general design the machine follows the company's semi-automatic crankshaft lathe for pin turning, previously marketed. It is equipped with power feed, a quick-change gear box, automatic split feed, automatic feed stops, and automatic accelerating device to crankshaft so that the lineal cutting speed of the tool bit remains constant. The drive is through silent chain from a 15 or 20-hp. motor mounted on the headstock. The arrangement of the herringbone gear and the centers is such that the chucking of the crank is simple and is said to require only 1 min. The net weight of the machine is approximately 17,500 lb.

Machine Facilitates Pipe Line Salvage

Every year it becomes necessary to discard or relocate many miles of existing pipe lines, especially in the oil and gas fields. Since there is a considerable investment represented in the pipe, the question of salvage is important. To facilitate the salvage of such pipe is the function of the pipe cutting machine shown in the illustration, which has been patented



The Machine Can Be Carried From Cut to Cut

recently by N. E. Wagner, welding superintendent of the Prairie Pipe Line Co., Tulsa, Okla.

The machine is light and can be carried from cut to cut along the line. It is adapted for several sizes of pipe and is compact, reducing the amount of bell-hole digging. Essentially, the machine consists of two gears and a framework so arranged that two Oxyweld oxy-acetylene cutting blowpipes are carried around the circumference of the pipe during the operation. The construction, which is simple, may be noted from the illustrations. When the crank handle is turned, the action of the gears causes the carriage supporting the two blowpipes to revolve about the pipe.

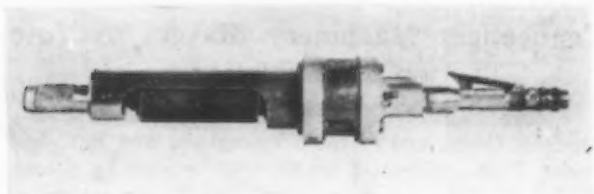
The blowpipes may be adjusted to any angle of cut

desired, although 45 deg. is usual. Distance between the cuts may be varied within reasonable limits. By using different sized internal shoes, the machine may be employed on different sizes of pipe, one machine being used on 4, 6 and 8-in. pipe merely by changing the internal shoe. Another machine, of larger size, may be used on 10, 12 and 14-in. pipe. The Wagner pipe cutting machine may be obtained from the Oxyweld Acetylene Co., 30 East Forty-second Street, New York.

Portable Polishing and Grinding Machine

The Buckeye Portable Tool Co., Dayton, Ohio, has brought out a portable air tool for polishing and grinding of the side rods of locomotives, as well as for other flat surfaces. Simplicity of construction and light weight are features of this tool, which incorporates the rotary principle and has but four moving parts.

The tool is 27 in. long, overall, 2½ in. in diameter at its largest point and weighs 15 lb. complete. The



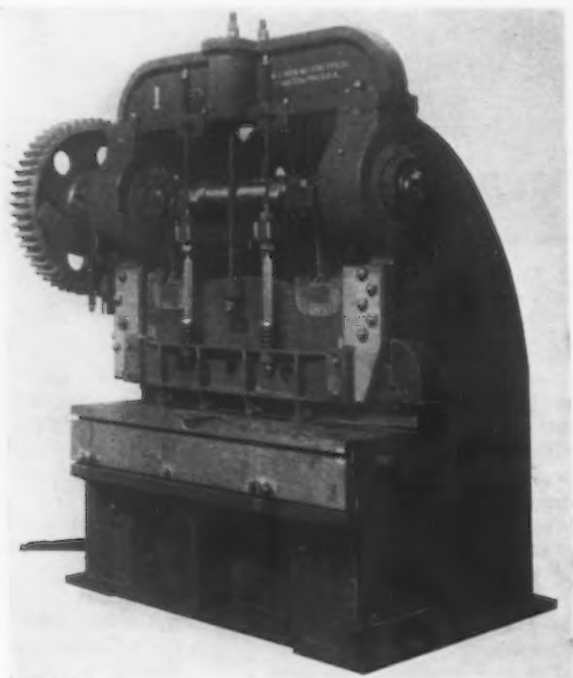
Side Rods of Locomotives May Be Polished and Ground

speed of the wheel is 6000 r.p.m. The polishing capacity is a surface 6 x 9 in.

Smooth operation is a feature stressed. In using the tool the operator takes the machine in both hands, places the polishing wheel over the part to be polished, and presses the safety control valve in the handle nearest where the air enters, causing instant operation of the tool.

Extra Blade Length Avoids Tearing Plates in the Shear

When a plate has to be cut in a shear in which the blade length is less than the length of the cut, necessitating two or more bites, a nick or tear in the plate may result unless special means are taken to prevent it. To avoid having to change blades or otherwise alter the shear for the purpose of making such a slitting cut, a new feature has been added to the gate or squar-



Using a Blade Longer Than the Housing Clearance, the End Protected by the Small Hood at Right, This Shear May Slit a Plate in Several Bites Without Special Knife Adjustment and Without Tearing the Plate

ing shears of the Long & Allstatter Co., Hamilton, Ohio. This arrangement is a standard feature on No. "C" machines and smaller.

By using this device, it is possible to cross-cut plates through the full width between housings as usual. It is possible also to split the plate to any length without changing blades. The innovation consists simply in lengthening the shear blades enough beyond the customary length so that the upper blade will not quite close at the lower end of the stroke.

As shown in the illustration, when the blade is down over the full length of the rated capacity of the machine, there is still a good gap at the right end. The uncut portion of the plate, under this upper portion of the blade, will not be torn as the corner of the knife does not hit it. It may be shifted along into position for further cutting as soon as the return stroke raises the blade.

Connecticut Machinery Makers to Vote on Consolidation

Stockholders of the Farrel Foundry & Machine Co., Ansonia, Conn., and of the Birmingham Iron Foundry, Derby, Conn., will meet on Sept. 20 to vote on a consolidation of the two companies. The Farrel company, which is capitalized at \$3,000,000, has plants at Ansonia and Buffalo, N. Y., and manufactures steel mill equipment, including special gears, mill pinions in cast, forged or alloy steel, reducing or increasing speed units, two-speed drives, etc.; chilled and grey iron rolls; rubber mill, sugar mill, rock crushing, celluloid and linoleum making machinery, and kindred products. The Birmingham Iron Foundry, capitalized at \$1,200,000, operates a plant at Derby and makes principally rubber, rolling mill, tin foil and transmission machinery.

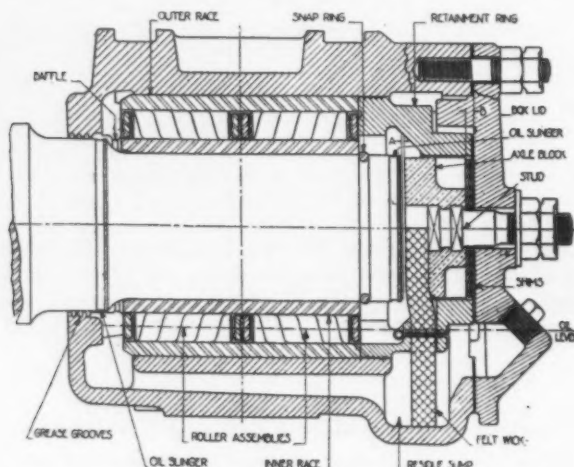
Roller Bearings Being Tested Out for Railroads

On the Chicago, Milwaukee & St. Paul a 12-wheel coach equipped with Hyatt roller bearings has run over 325,000 miles without attention to bearings, according to a statement of the Hyatt Roller Bearing Co. The design of railroad journal box shown is a development from the use of journal boxes equipped with roller bearings over a term of years.

In this design all likelihood of oil leakage is removed by a system of grease grooves just back of a baffle wall, which catches oil passing through the bearings and diverts it through an annular groove back to the oil reservoir.

Various methods of closing the box at the front have been tried. The most successful one is said to be the present design, where the box lid is separate from the spacer casting which holds the axle block in place. This assures that the lateral play of the axle will bring the axle end square against the axle block.

Trucks using this box are set up with a predetermined amount of permissible lateral movement of the axle, a desirable but unusual thing in an anti-friction railroad journal box. It closely parallels the practice with A.R.A. journal box and truck construction. Shims interposed between the axle block and the



Oil Leakage Is Avoided on This Roller Bearing, Designed for Railroad Use, by Catching the Oil Passing Through and Returning It to Reservoir

cover lid, in this design, permit precise adjustment of the lateral movement of the axle, tending to make railroad cars easier riding without undue swaying and jerks.

Breckenridge Machine Co. Acquires New Plant

The Breckenridge Machine Co., which has been engaged for the last three years in the building of machinery, particularly of the heavier type, and in production and jobbing work at the Colburn Machine Tool Works, 1038 Ivanhoe Road, Cleveland, has acquired a plant of its own at 1071 East 222nd Street on the Nickel Plate Railroad in Cleveland. The company's equipment, consisting of about 150 machine tools, each with individual motor drive, has been removed to the new plant and some additional tools of larger size will be purchased. H. W. Breckenridge is president of the company; A. A. Geck, vice-president, and W. E. Barrow, secretary and treasurer.

An explosion of two boilers at the plant of the Granite City Steel Works, the steel division of the National Enameling & Stamping Co., last week temporarily put out of commission 15 of its sheet mills. Ten of these were reinstated at the close of the week, and the rest will be in operation early this week. With the resumption of these units, the plant will be operating at 85 per cent of capacity. It has a backlog of orders which will enable it to carry on at this rate through September.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

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GENERAL BUSINESS OUTLOOK

Favorable Factors

1. The P-V line rises.
2. Curtailment in production where excessive.
3. Commodity prices stabilized and higher in July; upturn in scrap.
4. Farm prices higher; farm purchasing power improved.
5. Gain in unfilled steel orders.
6. Contemplated new construction increased in July and was high compared with contracts awarded.
7. Unusually easy money; high Federal Reserve ratio; net gold imports continue.
8. Retail trade large; mail order sales gain in July.
9. Decline in business failures.
10. Strong financial position of leading companies.
11. Light mercantile inventories.

Unfavorable Factors

1. The trend of building permits and contracts awarded continues downward.
2. Unsettled condition of the automobile industry.
3. Decline in employment.
4. Decline in car loadings and railroad earnings.
5. Foreign trade decreased in July, especially exports.
6. Narrow profit margins.
7. Large bank loans to brokers and dealers, secured by stocks and bonds.
8. Unfavorable weather conditions.
9. Political unsettlement.

INDICATIONS of improvement in business to come have increased. The large number of unfavorable conditions (notably the prevalence of wet, cool weather and the decline in exports) and further industrial recession, as evidenced by car loadings, employment and building permits, indicate that no pronounced expansion is likely before October and that the recovery in sight will be probably of moderate proportions. Some gain of greater than seasonal magnitude, however, seems certain and it should be marked by improvement in the buying of pig iron and steel.

OUR P-V line has shown the sharpest upturn since July, 1925 (see Fig. 1). A rise in this barometer of general business usually anticipates improvement by about five months. It means that on the average the demand for commodities has grown stronger in comparison with the supply. This forecasts better buying and firmer prices, which are the equivalent of improved business. The barometer is still somewhat below our estimate of normal (95 per cent), however, and as a rule recessionary trends do not end until the 95 per cent line is crossed on the rise.

These observations apply to steel production, because it rather faithfully parallels general industrial

conditions. Accordingly, steel production is expected to reach its low level in August or September, making due allowance for the merely seasonal changes, and to show a more than seasonal gain by October. It seems reasonable to expect that our adjusted production curve will fall below the normal line (100 per cent) before turning up.

Speculation Rampant While Traffic Lags

IN considering the two general business curves illustrated in the second chart, one is at once struck with the extraordinary divergence between freight traffic and bank debits. The tonnage of commodities

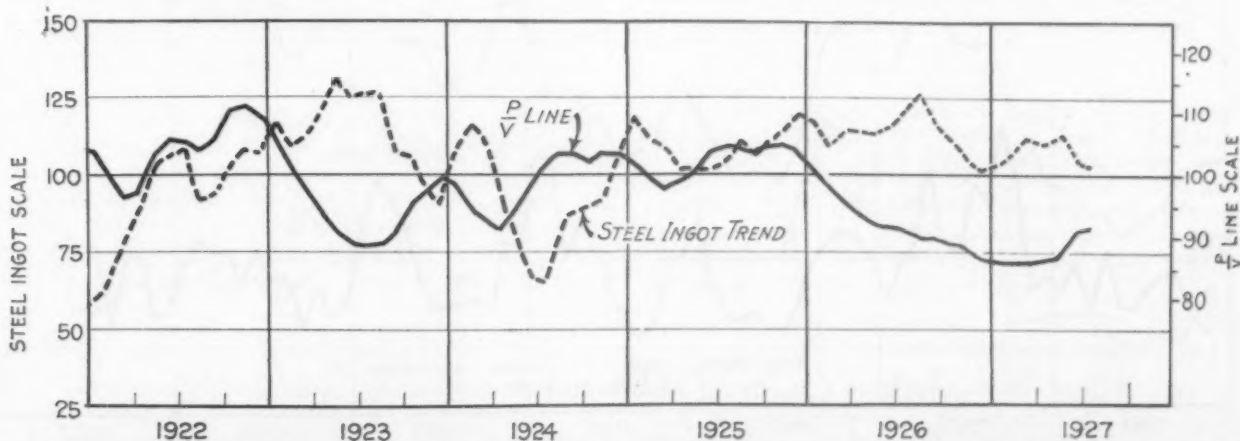


Fig. 1—The Upturn of the P-V Line (Representing the Ratio of Commodity Prices to the Physical Volume of Trade) Has Become the Sharpest in More Than Two Years. It presages improvement in business and forecasts both better buying and firmer prices. Ingot production, meantime, may cross the 100-line

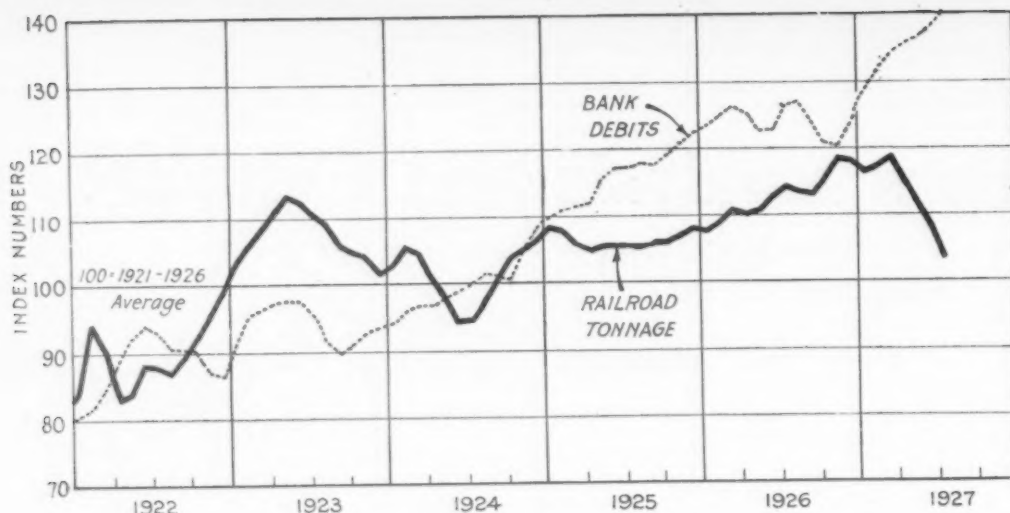


Fig. 2—Railroad Tonnage Returns and Those for Bank Debits Indicate That Trading and Speculation Are Much More Active Than Shipments of Commodities. Curtailment of freight tonnage has been sharp

hauled by the railroads has moved sharply downward, while the volume of checks drawn against individual accounts has turned upward almost as sharply. The one is at the lowest point reached since September, 1924; the other at the highest on record. Both curves are drawn from indexes adjusted to eliminate merely seasonal changes, and thus they show the true trend, regardless of seasonal conditions.

The decline in freight tonnage reflects the recession in industry that has gone on since March. If not the best, this is one of the best, measures of the physical volume of industry and trade. In part it is affected by the coal strike, but there has been a general decline in railroad traffic in such commodities as ore, coke, forest products and heavy manufactures. Freight traffic is now below normal and is well down to the average of the six years, 1921-1926. It is likely to show a further decline in August, judging by the recent trend of car loadings, though it appears improbable that it will fall as low as in mid-1924.

Great Expansion in Check Payments

At the same time, however, that the shipments of goods have declined, bank debits have steadily increased and, instead of being below normal, are probably something like 12 per cent above. Certainly they are 40 per cent above the average of 1921-1926. This is the

more striking because commodity prices have been declining. (In fact, if we were to estimate the value of railroad traffic, the result would be even lower than the tonnage curve.)

Checks are drawn for commodities or property bought and sold, payrolls, personal services, interest and dividend payments, rents, speculative and financial transactions, etc. Of course, foreign trade plays a part. Considering these various items, we find that the only ones which have increased anything like in proportion to the increase in bank debits have been the value of speculative transactions in stocks and certain kinds of commodities. Loans secured by stocks and bonds have shown a somewhat similar trend.

It is true, too, that retail trade and payrolls have been maintained at a fairly high level and have at least not declined as has the tonnage curve. Retail trade was well in line with bank debits up to the end of last year, but does not seem to explain the uninterrupted rise in the latter that has gone on this year. Wholesale trade in general and foreign trade in merchandise have actually declined of late.

On the other hand, in February, April, May and June the total value of shares traded on the New York Stock Exchange probably broke all records, being particularly large in April. Though the figure declined somewhat in July, it still exceeded any other month

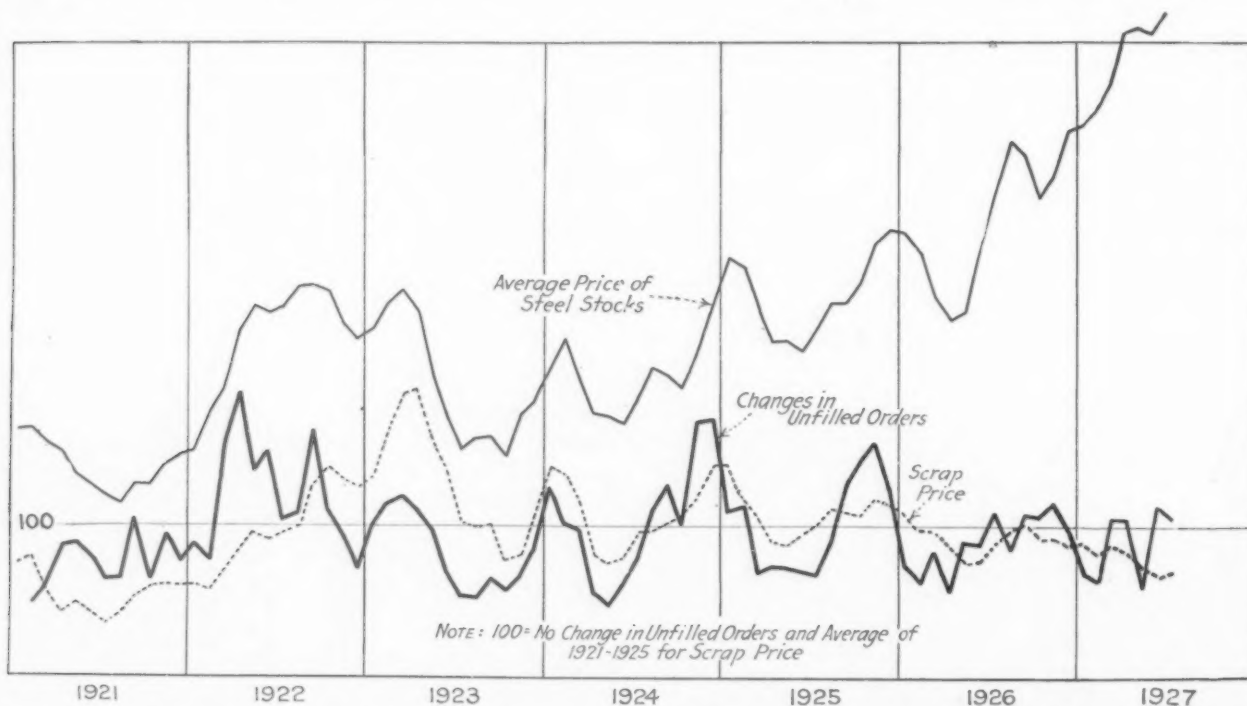
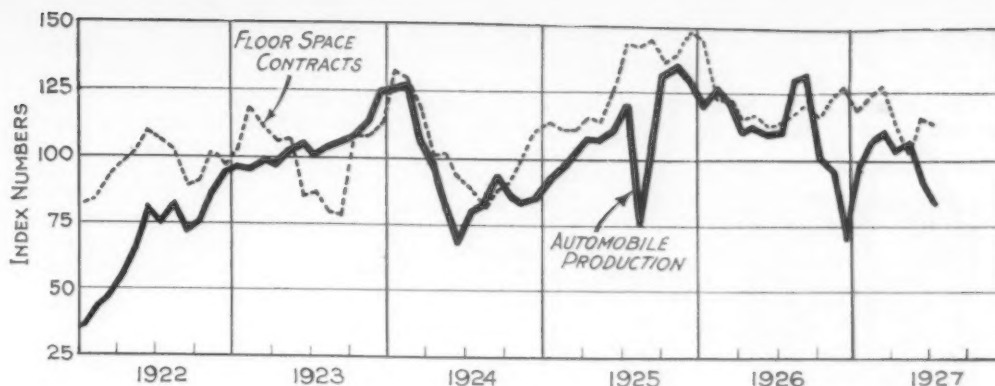


Fig. 3—Unfilled Orders Gained in Both June and July and the Price of Heavy Melting Steel, While Still Low, Showed a Little Improvement. Steel stocks, on the contrary, have reached higher and higher levels, which, perhaps, cannot be maintained on earnings of the immediate future

Fig. 4—Fair Gains in Building Construction Have Offset a Sharp Decline in Automobile Production. Both are likely to show totals for 1927 below those of 1926



since March, 1926. Trading on cotton and grain exchanges has also been of large proportions. This, together with the well sustained volume of retail trade, furnishes the best explanation of the rise in bank debits.

One cannot avoid the conclusion that "trading" of all kinds, including speculative transactions, is extraordinarily active in comparison with manufacturing or shipments of commodities. It is probably not accidental that the bank debits curve resembles rather closely the general trend of bank loans secured by stocks and bonds. There may be significance for the future in the continued upward trend of bank debits in face of the decline in production and railroad traffic. Evidently traders are still active in spite of the fact that steel producers are operating at a low percentage of capacity, and active trading must mean hopefulness as to the future of business.

Barometers Show No Clear Trend

IRREGULARITY and uncertainty characterize the impression one gains from an examination of various steel trade barometers in July. Their indications have been the least definite and clear-cut since 1921. It may be said, however, that the record is not unfavorable. In the first place, the unfilled orders of the Steel Corporation increased a little more than usual for the season, both in June and July. In the second place, the price of heavy melting steel scrap averaged higher in July than in June.

At first glance these statements would seem decidedly hopeful, but there are certain features which detract somewhat from this impression. Thus the net increase in unfilled orders in July was smaller than in June (when corrected for seasonal influences), resulting in a slight setback in the rate-of-change line illustrated in the chart. The scrap markets, also, were irregular, strength not being uniform in the different centers or among the different kinds of old material. In fact, a decline of 25c. has recently been reported from the Chicago market.

Stock Shares at New High Mark

Turning to the stock market we find that the average for a group of steel stocks has advanced further to a new high point and this indicates faith among speculators and investors in the future earnings of the industry. Certainly the advance has not been based on the earnings of the second quarter nor probabilities for the third quarter, for, on the whole, the recent trend has been downward.

The net conclusion is that the steel barometer is not unfavorable. The evidence is rather uncertain, but it leans toward improvement. One should note that

both the unfilled orders and the price of steel scrap are not at high points, but are decidedly low, a fact which suggests that any material change must be for the better.

Diverging Construction and Automobile Movements

OUR fourth chart shows one of the chief steel consuming industries to be operating at a rate above the average of recent years, the index of building activity being in July 113 per cent of the average for 1921-1925. Automobile production, on the other hand, is estimated to have been at about 82½ per cent. The outlook for these two industries is probably to be rated as "fair." There has been no severe decline and a little recovery is likely to occur this fall. Automobile production in the United States and Canada for the first seven months of the year is estimated to have been about 14 per cent lower than in the same period last year. Building contracts in terms of floor space in the first seven months were 4.6 per cent lower.

As to the total production of cars and trucks in the United States and Canada, the July figures are not yet definitely known but may be closely estimated at about 275,000 units. The United States production shows a decrease of about 17 per cent from June, which, considering the season and the shortness of the working time in July, is not so bad as some expected. The industry is unsettled at present, but a number of leading companies are doing well and with the aid of a large export trade should soon furnish a fairly satisfactory demand for steel.

Building contracts awarded in July fell off a little more than usual, but it is to be remembered that July had one less working day this year than last. Permits for building in cities and towns have shown a declining trend, also. However, a large volume of engineering construction continues and it is noteworthy that the July bookings of structural steel gained sharply. In view of the high level of contemplated new construction that is reported, and with such easy money conditions as prevail, construction may be expected to continue in good volume.

Foreign commerce of Ecuador is covered in an eight-page pamphlet of the Pan American Union, Washington. It shows that during the past five calendar years approximately 40 per cent of the imports have come from the United States, while a similar proportion of exports was sent to the United States. The ratios have varied somewhat from year to year, but have not departed far from the proportion given.

Schedule of the next installments of the *Business Analysis and Forecast*, by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows: Sept. 15—Activity in Steel Consuming Industries; Sept. 22—Position of Iron and Steel Producers; Sept. 29—General Business Outlook.

Gear Manufacturers' Fall Meeting to be Held in Montreal

Montreal, Canada, has been selected for the semi-annual meeting place of the American Gear Manufacturers Association. The sessions will be held at the Mount Royal Hotel, Oct. 20, 21 and 22.



E. J. FROST

Another announcement following the meeting of the association's executive committee in Cleveland, Aug. 19, was the reelection of officers. These are: President, E. J. Frost, president the Frost Gear & Forge Co., Jackson, Mich.; first vice-president, A. F. Cooke, vice-president the Fawcus Machine Co., Pittsburgh; second vice-president, B. F. Waterman, engineer Brown & Sharpe Mfg. Co., Providence; treasurer, Charles F. Goedke, secretary of the William Ganschow Co., Chicago.

F. W. Sinram, president of the Van Dorn & Dutton Co., is honorary president of the association. T. W. Owen, 2443 Prospect Street, Cleveland, is secretary.

Welding Conference at University of Minnesota

A conference embracing all phases of the welding industry is to be held at the University of Minnesota on Oct. 20, 21 and 22, according to plans worked out by Prof. S. C. Shipley, acting head of the mechanical engineering department of the College of Engineering. This is the first conference of this nature held by the University of Minnesota. A large part is to be given to papers read by practical users as well as round table discussions led by experts in their respective lines.

Papers for Institute of Metals at Detroit

Announcement is made of the technical program for the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers which is to hold a convention at the Book-Cadillac Hotel, Detroit, Sept. 20 to 22, in conjunction with the annual convention and exposition of the American Society for Steel Treating. Fourteen papers are to be presented as follows:

Symposium on Non-ferrous Commercial Alloys

- "Commercial Forms and Applications of Aluminum and Aluminum Alloys," by P. V. Faragher.
- "Principles Covering the Heat Treatment of Aluminum," by H. H. Richardson.
- "Machining Aluminum," by R. L. Templin.
- "Some Aspects of the Commercial Manipulation of Aluminum," by C. F. Nagel, Jr.
- "Physical Characteristics of Commercial Copper-Zinc Alloys," by W. H. Bassett and C. H. Davis.
- "Nickel and Monel Metal," by C. A. Crawford.
- "Wrought Zinc," by C. S. Trewin.

Other Papers

- "Equilibrium Relations in Aluminum-Silicon and Aluminum Iron-Silicon Alloys of High Purity," by E. H. Dix, Jr., and A. C. Heath.
- "Heat Treatment of Aluminum-Silicon Alloys," by R. S. Archer, L. W. Kempf and D. B. Hobbs.
- "The Condition of the Thorium Content of Thoriated Tungsten Filaments," by Ancel St. John.
- "X-Ray Analysis of the Plastic Deformation of Zinc," by T. A. Wilson and Samuel L. Hoyt.
- "Quantitative Spectrum Analysis," by F. Twyman and D. M. Smith.
- "Production of Metallic Single Crystals," by J. A. M. Van Liempt.
- "Twinning in Ferrite," by L. W. McKeehan.

There will also be one joint session of the institute with the A.S.S.T. on Wednesday, Sept. 21, at 2 p.m.

The usual dinner of the institute is scheduled at the same hotel for 7 p.m. Wednesday, Sept. 21. At this dinner E. Blough, technical director Aluminum Company of America, will be the principal speaker. He will discuss the general technical aspects of the aluminum industry, referring particularly to recent developments in aluminum and its alloys. He has been closely associated with the company for many years, particularly while the development of duralumin was in progress. Inspection trips to many of the plants of the automobile companies in Detroit have been arranged.

Technical Program for British Institute of Metals

The autumn meeting of the Institute of Metals (British) will be held Sept. 6 to 9 at Derby, England. The following technical papers are scheduled:

- "The Copper-Magnesium Alloys. Part II." By W. T. Cook and W. R. D. Jones.
- "Researches on Intermetallic Compounds. VI. The Reaction between Solid Magnesium and Liquid Tin." By W. Hume-Rothery.
- "Age-Hardening Tests with Elektron Alloys." By K. L. Meissner.
- "The Equilibrium Diagram of Copper-Tin Alloys Containing from 10 to 25 per cent of Tin." By A. R. Raper.
- "Note on Cathodic Disintegration as a Method of Etching Specimens for Metallography." By Cyril S. Smith.
- "The Protection of Aluminum and Its Alloys Against Corrosion." By H. Sutton and A. J. Sidery.
- "The Nature of the Film Produced by Anodic Oxidation of Aluminum." By H. Sutton and J. W. W. Willstrop.
- "Grain Growth in Compressed Metal Powder." By C. J. Smithells, W. R. Pitkin and J. W. Avery.
- "The Undercooling of Some Aluminum Alloys." By Marie L. V. Gayler.
- "The Constitution of Alloys of Aluminum with Silicon and Iron." By A. G. C. Gwyer and H. W. L. Phillips.
- "Effect of Work and Annealing on the Lead-Tin Eutectic." By F. Hargreaves.
- "The System Magnesium-Cadmium." By W. Hume-Rothery and S. W. Rowell.
- "The Constitution and Physical Properties of Some of the Alloys of Copper, Zinc and Cadmium." By C. H. M. Jenkins.

On the evening of Sept. 6, the sixth autumn lecture will be delivered by Dr. L. Aitchison on "Non-Ferrous Metals in Modern Transport."

To Entertain Drop Forgers at Detroit

The Drop Forge Supply Association, of which Charles Harmon of Chambersburg-National, Chambersburg, Pa., and Tiffin, Ohio, is president; Jules Dierckx of the Keller Mechanical Engineering Corporation, Brooklyn, vice-chairman; and C. E. Wertzel of the Heppenstall Forge & Knife Co., Pittsburgh, secretary, will tender a dinner to the visiting drop forgers who will be in attendance at the National Steel and Machine Tool Exposition that will be held in Detroit the week of Sept. 19. H. Deane of the forge division of the Chevrolet Motor Co., and Ed. Graham of A. Finkl & Sons, form the Detroit committee in charge of this dinner. It will be held on Wednesday evening, Sept. 21, at the Harmony Club. Attendance at the dinner will be strictly by tickets, which will be issued by President Harmon, who will be in the booth of the Chambersburg-National. It is requested that all drop forgers in attendance get in touch with Mr. Harmon and make arrangements to attend.

A new Ford truck, embodying the same principles of motor and chassis design as the new Ford automobile, will be introduced early in the coming fall. The new truck, according to the Ford Motor Co., will have double the horsepower of the present model and, like the new Ford car, will be equipped with improved cooling and ignition systems and new steering and transmission mechanisms.

Choice of a Successor to Judge Gary

Action May Not Be Immediate—Chief Future Problems
Those of the Whole Industry—Presidency
of the Steel Institute

WHO will succeed Judge Gary as chairman of the United States Steel Corporation? The question has been often asked in the past week; but it is not a new subject of discussion among producers and consumers of steel. For more than ten years, or ever since the American Iron and Steel Institute's testimonial to its president on his seventieth birthday, the question of the succession to his office in the Steel Corporation has been discussed more than any other having to do with the future of American steel. Rarely was such a discussion had that did not bring out the observation that the Steel Corporation had been marvelously favored in having such leadership and that probably no man among Judge Gary's contemporaries could have directed the corporation's affairs with the wisdom and capacity he had shown.

Men in the steel trade have been as ready to offer opinions on Steel Corporation policies as the average citizen is to express himself on the administration of the Government at Washington. There was general recognition of the corporation's leadership, as there was also of the leadership of Judge Gary. This was due in part to the commanding position of the corporation, its exceptional capitalization and its great producing capacity. Also it was a result of the leadership of Judge Gary and the Steel Corporation in the critical period following the panic of 1907.

Back of all the opinions so freely expressed in the past 20 years as to what the corporation had done and should do, and all the forecasts of policies yet to be, was the belief that the decisions of Judge Gary and his associates had brought a stability the industry had never known before and that had benefited every company, small and great, engaged in the manufacture of steel in the United States, as well as every domestic industry having steel as its raw material.

It is no surprise, therefore, that widespread interest is shown in the forthcoming action of the Steel Corporation's board of directors. Last year ex-Gov. Nathan L. Miller of New York and Myron C. Taylor, the latter representing railroad and other interests in which George F. Baker and the First National Bank of New York have been prominent, were elected directors of the Steel Corporation and members of its finance committee. It was then said that ex-Gov. Miller, who had just been made general counsel of the Steel Corporation, in time might be considered in connection with the chairmanship. In the past week his name has been mentioned again, as has that of Mr. Taylor.

The thought behind such mention seems to be that public relations will continue to be an important factor in the Steel Corporation's affairs as it has been in the past 25 years. Without doubt public relations, Government relations, and broad public policy will always engage the best thought of Steel Corporation leaders. But it is also true that the corporation's policy in respect to the public and the Government, as well as labor, has been well established in the years of Judge Gary's leadership.

Steel Trade Problems of the Future

Thus the questions which will make largest demands upon the Steel Corporation's management in the next few years are more likely to have their origin in condi-

tions affecting all steel manufacturers than in conditions growing out of the Steel Corporation's exceptional size and the fact that the Government once brought into question its right to exist. In other words, the problems of the nearer future will be problems of markets and prices, of relations with competitors, of new uses for steel, of the expansion of the Steel Corporation's producing capacity, and of the extension of its foreign trade. In the handling of all these questions, President Farrell has acquired an experience in the past 16 years that makes him the logical head of the Steel Corporation, whatever disposition may be made of the chairmanship of the board of directors or of the Finance Committee. Mr. Farrell's testimony in the Steel Corporation's dissolution suit was a marvelous exposition of what had been accomplished in the first ten years of the Steel Corporation in winning export markets for American steel. In more recent years his chairmanship of the National Foreign Trade Council has made him an outstanding figure in the development of American foreign trade. In the domestic market his intimate participation in the large-scale selling activities of the Steel Corporation's subsidiaries is well known.

Since Mr. Farrell's accession to the presidency in early 1911 he and Comptroller William J. Filbert have been continuously associated with Judge Gary in the execution of the decisions of the Finance Committee. With that background both are naturally mentioned in current comment in the steel trade as large factors in the future administration of the corporation's affairs, whatever readjustment of functions may be made under the new regime. The Steel Corporation's annual reports for years have exemplified the new willingness of corporation executives to let their stockholders and the public know the whole story of their financial conduct. In this and in other respects they have been a monument to the prodigious industry and the high capacity of Comptroller Filbert.

The Succession in the Iron and Steel Institute

The succession to Judge Gary as president of the American Iron and Steel Institute has brought about a number of informal nominations, indicative of individual preferences. Besides the three vice-presidents, James A. Farrell, who for years has been chairman of the committee of arrangements for the two general meetings held each year, has been mentioned. The vice-presidents in order of seniority are Willis L. King, Jones & Laughlin Steel Corporation; Charles M. Schwab, Bethlehem Steel Corporation, and John A. Topping, Republic Iron & Steel Co. The suggestion is voiced in unofficial circles of putting the tenure of office for president at one year, apparently looking to tendering the office in turn to those now serving as vice-presidents.

The directors of the institute have of course been giving consideration for some time to the headship and conduct of the organization, following the request last May by Judge Gary that his fellow directors choose his successor in the year just ahead—a request first referred to publicly in last week's *IRON AGE*. Action can hardly be expected before Sept. 15, the date of the next regular meeting of the institute directors. It will

not be surprising if some changes are made in the handling of the sessions or if Mr. Farrell should desire to be relieved of the responsibility he has long borne of marshaling papers for these meetings. The high character of the technical programs has been recognized not only at home but in foreign countries, and what THE IRON AGE said editorially Nov. 19, 1925, may well be repeated here:

It is simple truth to say that the last ten volumes of the Year Book of the American Iron and Steel Institute represent a larger contribution to the metallurgy of iron and steel and to the world's knowledge of iron and steel works operation at their best than the proceedings of all other organizations at home or abroad for the entire decade. . . . The American Iron and Steel Institute is most fortunate in the cooperation of the Steel Corporation and various independent companies in the literary contributions of their talented young operating men.

It remains that a foundation has been laid and a reputation made that will be of great help to Secretary Clarke and to future program committees in continuing the work of the institute.

Question of Filling Chairmanship

THE Finance Committee of the Steel Corporation held its regular Tuesday meeting this week and, according to an announcement, transacted routine business. The fact that President Farrell presided was made much of in some quarters, but the by-laws of the corporation provide that the president shall so serve in the absence of the chairman of the board or chairman of the Finance Committee.

A scrutiny of the by-laws, it may be said in passing, suggests the possibility that the chairmanship of the board may remain vacant for a considerable time. In section 1 of article IV it is stipulated that

In its discretion, the board of directors by the vote of a majority thereof may leave unfilled for any such period as it may fix by resolution, any office except those of president, treasurer, secretary and comptroller.

The board of directors must designate a member of its Finance Committee as chairman of that committee; but the chairman of the board is by virtue of his office a member of the Finance Committee. "One person may hold more than one office"; so that the chairman of the board and the chairman of the Finance Committee may be one and the same person.

The seniority of office is indicated in the following relating to the powers and duties of the president, being section 3 of article IV:

In the absence of the chairman of the board and the chairman of the Finance Committee, the president shall preside at all meetings of the stockholders and of the board of directors. Subject to the board of directors and the Finance Committee, he shall have general charge of the business of the corporation relating to manufacturing, mining and transportation and general operation. He shall keep the board of directors and the Finance Committee and the chairman of the board and the chairman of the Finance Committee fully informed, and shall freely consult them concerning the business of the corporation in his charge. He may sign and execute all authorized bonds, contracts, checks or other obligations in the name of the corporation, and with the treasurer or an assistant treasurer may sign all certificates of the shares in the capital stock of the corporation. He shall do and perform such other duties as from time to time may be assigned to him by the board of directors.

Thomas K. Glenn's Tribute to Judge Gary

In addition to the expressions concerning Judge Gary's life and work which came to THE IRON AGE last week from other directors of the American Iron and Steel Institute we have this notable one from Thomas

K. Glenn, chairman Atlantic Steel Co., Atlanta:

"It is difficult to sum up in a few words my estimate of Judge Elbert H. Gary. I knew him personally and well during the past 20 years. To really know him was to admire him the more. He was to labor a friend, though their vigorous antagonist when he believed their claims unfair.

"He was a builder whose constructive imagination never outran his powers of execution and whose keen and tenacious sense of work-a-day realities never dimmed the broadness of his vision.

"He possessed resourcefulness, courage, skill and perseverance in the many problems which presented themselves in his widespread business affairs. In stormy and tremendous times, when stability of character served to prevent one from being swept from his moorings, he was ever firm and unshaken, cool amid danger, serene amid alarms. There are not many in the business world whose constructive force enables them to point with proper pride to an enduring evidence of their own labors. He built his own monument.

"He held a high place in the confidence and admiration of the entire business world for integrity, force of character, tenacity of spirit, courage of conviction and sincere earnestness of purpose.

"His large mental stature and staunch moral fiber made him an outstanding figure of his period. To me he was a masterful man, for he never shrank from the performance of a duty.

"Seeking no public office, no high political station, but desiring to be true to his cause, to deal justly and give each man his due, to slight no day's work, he walked among us with the gift of good will toward all in his eyes and in his soul true justice. He carved his name upon the hearts of his friends in characters far more lasting than though carved in marble and certainly more significant. What a fine record of high character, devotion to duty, unselfish service and a spirit unquenched and majestic even in death!

"If human conduct is influenced by the example of those gone before, if inspiration for better things comes from the study of a worthy and fine nature, what a legacy he has left to his country.

"His work for the United States Steel Corporation in particular and for the steel industry in general stands out in such bold relief that nothing I could say would add to it."

Gary Scholarships at Eight Colleges

Under the will of Judge Gary, probated Aug. 23, bequests of \$50,000 each are made to eight institutions of learning to establish scholarships for students "least pecuniarily able to pay tuition and who are morally, mentally and physically worthy and competent." The institutions are the following:

McKendree College, Lebanon, Ill.
University of Pittsburgh, Pittsburgh.
Lafayette College, Easton, Pa.
Trinity College, Hartford, Conn.
Lincoln Memorial University, Harrogate, Tenn.
Syracuse University, Syracuse, N. Y.
Northwestern University, Chicago.
New York University, New York.

Colonel Lindberg's engine is the subject of illustrated description in an eight-page pamphlet prepared by the development and research department of the International Nickel Co., 67 Wall Street, New York. The author is Thomas H. Wickenden. Attention is called to the fact that the same model engine was used also by the Chamberlin plane, by the plane flown by Commander Byrd, and by the army plane which flew to Hawaii. A different model of the same make of engine was used by Commander Byrd in his North Pole flight. The engines, designed by Charles L. Lawrence, were made by the Wright Aeronautical Corporation, Paterson, N. J. The description shows the type of steel used in a large number of parts of the engine and is devoted largely to the question of alloy steels in the engine, particularly those steels containing nickel.



BOOK REVIEWS



The Marketing Problem. How It Is Being Tackled in the United States. By Edward T. Elbourne, director of marketing investigation, Shaw Wardlaw & Co., Ltd., London, England. Pages, 216, 8½ x 5½ in. Published by Longmans, Green & Co., Ltd., 39 Paternoster Row, London, E. C. 4, and 55 Fifth Avenue, New York. Price, \$4.

How we look to foreign visitors is a subject of common interest to newspaper interviewers whenever noted travelers from overseas depart from our shores. The comments range from the impressions created by our high buildings to prohibition, but most of these expressions are random observations, it being seldom that foreigners come here for the purpose of taking home to their countrymen something of real value concerning the methods that have made the United States great in the eyes of an admiring though at times envious world.

The author is a serious-minded observer whose findings are printed within the covers of a book designed to carry the best of our marketing methods back to Great Britain. Commenting on the American business spirit, Sir Josiah Stamp in a foreword says of conditions here: "There is a restlessness of mind, a refusal to take old ideas for granted, a pitiless scrutiny of every corner of the economic structure, an eagerness to try every new thing, that must score often even if they miss their mark many times. . . . There is such an abundance of data, of propaganda, of statistics, that a great deal of it must contrive to get effectively into the industrial machine."

The author mentions that American methods are viewed by many on the other side of the Atlantic with antagonism. To further international rapprochement in industry, the author says "it will be a great satisfaction . . . if the reading of this book helps to foster a regard for the United States commensurate with that regard for England so abundantly evident to the visitor."

The book is divided into 14 chapters devoted to such subjects as commercial research, official information service (such as supplied by Government departments), elimination of waste, trade association activities, advertising, institutional publicity, marketing literature, etc. There are references in the addenda to organizations, commodities and industries, books and other publications.

Patents: What a Business Executive Should Know About Patents. By Roger Sherman Hoar. Pages, 232. Published by Ronald Press Co., New York. Price, \$4.50.

This book is intended to enable the ordinary—that is, average—executive to understand his patent attorney, being in that fact a reflection on the latter, who should be able to make himself clear without an interpreter. It comes very near to doing what it sets out to do, although once in a while, for instance in the matter of the distinction between "anticipation" and "domination," and in defining "reading on," it fails. If the manuscript had been submitted to two or three manufacturers or inventors, they might have suggested that sometimes the explanation hardly explains. Nevertheless, there is much valuable information between its covers, telling as it does what may and what may not, what should and should not, be done. A few more "don't's" would have been useful, among them, a caution against acting as one's own patent attorney, especially in the matter of foreign applications. (Even patent attorneys are admitted by the author not always to have much knowledge of what to do in interferences.)

The chapter on "Conflicting Rights" should be read twice, and its information applied early and often. Forms for patent contracts are given and cover most possible cases. When it comes to foreign patents, the book might, for instance, have warned against the British preliminary patent, and informed the inventor

that a French patent, being "s. g. d. g."—that is, "without guarantee by the government," has about as much value as last year's bird's nest—being merely a receipt stating that at a given hour and minute on a given date, A or B deposited a document (that might have been a description of Noah's Ark) and paid a fee. Also, the utter futility of the German *Gebrauchsmuster* as a bluff might have been pointed out, and the inventor warned that the German patent application must be the first one made, if he does not wish to have his German patent invalidated by his home priority precautions. (In the matter of bluff, the Japanese *zitsuyo shin-an* "patent" is in the same category.)

A good alphabetical index enhances the value of the book, which inspires and deserves confidence. R. G.

Gas Analysis. Methods of the Chemists of the United States Steel Corporation for the Sampling and Analysis of Gases. Pages 187 + xiv, 25 illustrations, 6 x 9 in., paper binding, published and sold by Carnegie Steel Co., Bureau of Instructions, Pittsburgh. Price, \$2.

This book is the result of more than two years' work of a special committee composed of chief chemists of the subsidiary companies of the United States Steel Corporation, and is the third complete revision of what was in 1911 a small pamphlet. Much intensive work was necessary to devise the best methods and equipment, in view of the great changes in operating conditions which have taken place in those 16 years, due to the wide use of by-product coke oven gas and pulverized fuel.

The book is more than a description of methods. It emphasizes the importance of accuracy and recognizes the fact that accuracy is not to be obtained in every case by a blind following of directions. It contains a great deal of information on the sampling, analysis, measurement and combustion of gases, which makes it a work of interest not only to chemists, but also to combustion and efficiency engineers, students, and in fact, any one interested in the combustion and handling of fuels.

One of the chief benefits derived by the Steel Corporation from this publication will probably lie in the fact that the analytical results from all of the plants of the corporation will be comparable. Comparable results make possible a study of the value and efficiency of different raw materials, plant equipment and plant operations.

Part I contains a detailed description of the construction, operation and care of the new apparatus adopted for gas analysis. It is of the Orsat type, with new and original absorption pipettes of the bubbling type. Instead of the three-way stopcock required on the older forms, they contain a glass float valve which automatically opens and closes as the gas is drawn out or forced into them. These bubbling pipettes are therefore interchangeable with contact pipettes, and overcome the former objections to bubbling pipettes and offer all the conveniences of the less efficient contact pipettes filled with glass tubes. Other valuable features consist of a manifold with special three-way stopcocks, eliminating all dead space in the capillary tubing, a non-shatterable glass protection shield and an improved manometer. The apparatus can be moved about from place to place without disturbing any of the connections; it is equipped with a slow combustion pipette, an explosion pipette, a copper oxide tube and a special burette for the analysis of mine air. This equipment permits the use of different methods of analysis and makes it possible to analyze with accuracy any gas met in industrial work. All equipment for carrying on combustion is electrically operated, and

(Concluded on page 520)

CONTENTS

August 25, 1927

Sand Handling Mechanized.....	461
Special Steel for Hudson River Bridge	466
Powdered Coal for Plate Mills.....	469
The "Danger Line" and the "Color of Ink"	473
Suggests Annealing for Welded Pipe	474
Choice of a Successor to Judge Gary	487

Gripping Force Exerted by Ingot Tongs	465
Murals at Norton Plant.....	477
High Copper in Steel Not Good.....	468
Connecticut Companies May Merge.....	482
Foundry Merchandising and Budgets.....	495
Industrial-Brown Hoist Merger.....	513
New Trade Publications.....	513
Sickness Among Industrial Employees.	522

MEETINGS

Gear Manufacturers' Fall Meeting....	486
Institute of Metals at Detroit.....	486
British Institute of Metals.....	486
Drop Forgers at Detroit	486
Ohio State Foundrymen.....	495

NEW EQUIPMENT

Dial Feed Tapper.....	478
Rocker Joint in Transmission Chain...	478
Sheet Leveling Rolls.....	479
Wheel Truing Attachments.....	479
48-in. Tilted Offset Miller.....	480
Built Up Steel Cart.....	480
Center-Drive Crankshaft Lathe.....	481
Machine Facilitates Pipe Line Salvage.	481
Portable Polishing and Grinding Machine	481
Extra Blade Length in the Shear....	482
Roller Bearings for Railroads.....	482

STATISTICAL

More Aliens Arrive.....	476
Production of Pig Iron in First Half...	521
River Shipments of Iron and Steel....	522
Wholesale Prices Turn Upward.....	522
Production of Iron and Steel in Canada	522
Steel Barrel Production.....	522

DEPARTMENTS

Business Analysis and Forecast.....	483
Book Reviews	489
Editorial	492
Iron and Steel Markets.....	496
Comparison of Prices.....	497
Prices, Raw and Finished Products..	499-501
Non-Ferrous Metals	514
Structural Awards and Projects.....	515
Railroad Equipment Buying.....	516
Reinforcing Steel Business.....	516
Personals	517
Obituary	518
European Steel Markets.....	519
Machinery Markets	523

What to Know in Buying

BUYERS are presumed to know why they make certain specifications. It is sufficient that they provide what is needed for further manufacture or assembly, but they must be constantly alert in respect to changing conditions or changing processes among suppliers. In this way can they be sure always to get the best product for their own purposes.

It is the common complaint among almost any group of makers that inordinate demands are made, or old-time practices are allowed to persist, that, properly explained by a supplier, would serve to remove contention and establish economies. With this fact in mind, THE IRON AGE obtained recently from producer sources two articles on "what to know in buying." One of these, on die castings, appeared in the issue of July 21 and the other, on metal stampings, appeared Aug. 4.

This Issue in Brief

Mechanical sand handling system in automobile factory has greatly reduced number of man-hours consumed. Time is saved in transfer of incoming sand to storage, in recovery from storage and delivery to mills, in mixing and in distribution to foundry.—Page 461.

Gripping force of ingot tongs may depend largely on width of opening between dogs and angle through which toggle acts. Investigation by English engineer revealed fact that defective tongs usually have a much higher required coefficient of gripping than successful tongs.—Page 465.

Distribution of detailed information about a specialized product or process to a selected audience is sole reason for "house organ" designed for customer circulation. Definite editorial aim, adequate sources of information and illustration about problem to be clarified and carefully selected mailing list are prerequisites for its success.—Page 494.

Says annealing would increase dependability of welded steel pipe. Tests showed weakness in area surrounding weld, brought about by change in crystalline structure during welding process. Further tests after annealing test strips showed higher average yield point, greater tensile strength and higher per cent elongation, with majority of fractures in welds rather than in adjacent zones.—Page 474.

Hudson River Bridge at New York will require approximately 150,000 tons of steel. Although structural tonnage will be largest ever taken by single project, no unusually large members will be needed and thicknesses of plates and shapes have been kept below $\frac{3}{8}$ -in. where possible so that rivet holes may be punched and reamed rather than drilled.—Page 466.

Use of wire cable design for Hudson River Bridge would call for 195,800,000 lb. of materials, including 57,200,000 lb. of cable wire and 47,600,000 tons of silicon steel in tower. Eye-bar cable plan would call for 271,080,000 lb., with 114,200,000 lb. of heat treated eye-bars and 56,000,000 lb. of silicon steel in tower.—Page 467.

Inauguration of use of powdered coal in plate mill heating furnaces has resulted in lower costs during intermittent operations, lower furnace maintenance, elimination of ash handling, lower labor costs, stimulation of production due to increased heating capacity, better heating and improvement in quality of products.—Page 470.

Price cutting in steel industry to secure more business has not increased sales enough to compensate for loss of revenue due to lower quotations. Engineer says heavy war-time profits have carried many companies along in ruinous policy, but that situation will be automatically remedied.—Page 473.

High copper content of pig iron is often responsible for rendering sheet steel less amenable to dishing out under the press, while in heavy work this difficulty is not met. German investigation also showed trouble of removing scale from high-copper sheets gave them a rough surface and poor appearance.—Page 468.

Can unload sand from cars at rate of 40 to 50 tons per hr. with crew of only two men. In new handling system at Packard plant sand is discharged from cars into hopper and is passed into building by a pan feeder which delivers it to a vertical elevator. The elevator carries sand to a point above a series of storage bins where it is deposited on a distributing belt extending entire length of storage building.—Page 461.

Increase in unfilled orders of Steel Corporation and advance in average price of heavy melting steel scrap are most favorable barometers in steel industry. Dr. Haney also believes high market prices of steel stocks indicate faith in industry on part of investors.—Page 485.

Principle of introducing capital gains and losses into an income tax law should be discarded. When these apply to certain speculative transactions what is gained by one man is lost by another, and the tax gatherer must only break even.—Page 492.

Dr. Haney believes indications of improvement in business have increased. Yet unfavorable conditions, particularly unseasonable weather and decline in exports, would seem to prevent pronounced expansion before October and that only of moderate proportions.—Page 483.

Increase of 33.4 per cent in production of low phosphorus iron during first six months of 1927, as compared with preceding six-month period, indicates larger output of acid open-hearth castings. Official figures show scarcely any variation in rate of production of other grades of iron.—Page 493.

Mural paintings in assembly hall of abrasive plant trace life of company's product from bauxite mine to finished wheel. Specimens of raw materials used, of grinding wheels, finished and in various stages of production, and of work done by them are also exhibited in room.—Page 477.

Urges gray iron foundries to meet competition of other products. Convention speaker says over-capacity in industry has led to need for new markets and development of new products for future markets. Study of merchandising methods is also necessary.—Page 495.

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Some Needed Tax Reforms

AT the forthcoming session of Congress the revision of the Federal income tax law will be the first subject to be undertaken. The Committee on Ways and Means and advisory bodies are already making preparations. They have invited suggestions from the public.

Probably it would be futile to suggest any change of theory, such as the substitution of consumption taxes for income taxes, or even to broaden the system of taxing incomes so as to include all incomes above the line where the tax and cost of collecting it are equal.

We may, therefore, confine ourselves to the expectation that there is to be a substantial reduction in the total levy, and the hopes that the reduction will occur mainly in the rate on corporations and in the scale applying to the middle incomes, and that some of the annoyances of the existing law may be eliminated.

The tax on corporations is a relatively easy one to collect, but it may well be recognized that the income of corporations is mainly distributed to persons who are obliged to pay direct taxes on their dividends, and to a large extent sur-taxes.

It may also be remembered that the class of taxpayers of income from \$20,000 to \$50,000 a year has had but relatively little benefit from previous reductions.

The matter of making out income tax returns under the existing law, although it involves the use of a formidable blank form, is really not so nerve-racking, time-consuming and complicated as is represented in newspaper comment and discussion. Most persons, even those of intricate affairs, make no great fuss over their returns. There are, however, some matters of principle that may well be established and some evils that may well be eliminated.

The whole principle of introducing capital gains and losses into an income tax law should be discarded. In so far as these apply to certain speculative transactions what is gained by one man is lost by another and the tax gatherer stands to lose

as much as he wins. Profits resulting from real appreciation in value correlate with increase of income, on which tax has already been paid and is going to be paid. On the other hand, losses resulting from extinguishment of principal—for example, in such a matter as the Russian internal bonds—serve the taxpayer as an abatement without giving the Government any compensating benefit. Capital gains or losses do not figure in the British system of income taxation.

If Congress will not accept the idea of abolishing taxation on capital gains, and if March 1, 1913, must remain as a starting point, it should at least be recognized that neither Congress nor anybody else knew how to determine retrospectively values as of that date, that they were necessarily the subject of discussion and mutual agreement, and that once such an agreement had been made between the taxpayer and the Bureau of Internal Revenue it should stand. This would eliminate the possibility of repudiation and reopening such as is pending in the case of the stock of the Ford Motor Co.

The next Congress ought to correct the absurdity in respect to earned income. If it be desired to continue the abatement on all incomes under \$5,000, let that be done, but do not define all incomes under that limit as being earned *ipso facto*. On the other hand, relieve us from the implication that incomes of more than \$20,000 cannot possibly be earned, being inferentially stolen, or at least profiteered.

A great evil in the present system is the delay in auditing income tax returns. If Congress will not provide the Bureau of Internal Revenue with an adequate staff to do that work promptly, it should reduce the time limit during which review is possible. It is hard for any taxpayer in 1927 to enter into discussion of a tax return for 1922 just taken up for audit. When a taxpayer dies, his executors cannot be sure of discharge of all obligation from the Federal Government until after the passage of five years. Dissolution of copartnership may not safely be made without a similar allowance. The great majority of returns are accepted by the bureau following first examination. Recently

the bureau has instituted the practice of notifying taxpayers to that effect in respect to their returns for 1926. This sensible innovation should be confirmed by Congress lest some future bureau administration withdraw it.

Sheet Metal Gets New Dignity

IT was something of a shock, on opening the package containing a small cash register, to read the name of the maker—a leading can company. So, in order to find the connection between cash registers and tin cans, the toy was dismembered and found to consist entirely of sheet metal stampings and wire products.

In the last fifteen years sheet metal has thus found itself in stranger quarters. It is being used in steadily increasing amounts in many manufacturing industries in the United States. This wider use has come from the growing attention given it by engineers and progressive managers. In fact, in the older fields—such as the manufacture of ventilating ducts, flashings and inexpensive utensils, dominated by the sheet metal worker—the artisan—serious inroads have been made by other products.

It may not be too much to say that welding has played an important part in this development of sheet metal. Graceful furniture, office equipment, automobile bodies, architectural trim, machine parts of wide variety and complexity, nearly all require a smooth joint, practically 100 per cent strong, absolutely concealed by the finish. This is impossible with the old crimped, rolled or riveted joints.

Quantity production has also brought its train of associated problems. From the metallurgist metal of accurate, uniform gage, superfine surface and exceptional ductility has been demanded. From the mechanical engineer, or rather from a specialist, it has required jigs and fixtures of a great variety of form; extremely ingenious holding and registering devices can be found in operation, none the less admirable because of their essential simplicity.

By combining forces, the designer, the metallurgist, the mechanical engineer and the production man in many fields have converted sheet metal from a tinshop supply to a major material of engineering construction.

Employees' Wage References

IN an address before the American Management Association Earl Morgan, manager of the employment and service department of the Curtis Publishing Co., said in discussing the use of references in the taking on of new workers:

"Personally, in making a request of a previous employer, I favor a personal letter along the lines of the following:

"John Doe, 100 East Second Street, Philadelphia, has applied to us for employment and refers to your company for his employment record as a machinist under Mr. Black, at \$42 per week, from January, 1921, to December, 1923, when he resigned for another position. We will appreciate and treat this information confidentially."

There has been some criticism of that part of

the above inquiry which relates to previous earnings. The critics believe this savors of the unethical, as an intrusion upon a man's private affairs and an interference with the independence of action which is his right. It is enough, they maintain, to ask concerning an applicant's character, industry and skill. They appear to believe the only reason for asking him or his former employer what he has been earning is that he may be hired at the lowest possible wage.

Generally the intention of the questionnaire an applicant for employment is asked to fill out, including references and wage paid him in former employment, is to get as close a line as possible upon his desirability as a workman. The case is rare in which he would not be offered the rate prevailing in the plant of his prospective employer, but the previous wage affords a measure of the man's ability. In the ordinary hiring of labor the sending of an inquiry to former employers is more often than not omitted, and when it is sent the purpose is to check on the statements of the applicant, for not all men are honest in telling their qualifications.

Another useful purpose of getting information on an applicant's earnings lies in keeping in touch with the labor market as it affects a particular industry, in meeting competition, and in flush times in maintaining the working force with a minimum of labor turnover.

Steadiness in Pig Iron Outlets

PIG iron production statistics for the first half of the year just issued by the American Iron and Steel Institute show almost no variations in the distribution of output among the different grades from the first half of last year. The total for the half year has been known closely from the monthly reports of THE IRON AGE, which as heretofore have agreed closely with the official total. The institute total of pig iron (including charcoal iron) and ferroalloys for the half year is 19,567,554 tons. Deducting the 85,052 tons of charcoal iron leaves 19,482,502 tons for comparison with THE IRON AGE total of 19,430,678 tons, making a divergence of 51,824 tons, one-fourth of one per cent or only half a day's production. This difference is largely represented by those ferroalloys of which THE IRON AGE does not gather statistics.

Comparison between the first half of 1926 and the first half of this year shows a decrease of 2.2 per cent in the total. Production of basic, Bessemer and low phosphorus iron decreased 1.9 per cent, while production of foundry iron decreased 4.3 per cent and of malleable iron 3.3 per cent. Such divergences are too small to suggest any general trend in pig iron uses. An interesting point, however, is that low phosphorus iron increased 33.4 per cent, or from 145,467 tons to 194,033 tons; indicating a larger output of acid open-hearth castings.

A long range comparison shows the relatively small part played by the converter. In 1906, the year of maximum production of Bessemer steel, production of Bessemer pig iron (not including low phosphorus) was 13,611,749 tons, or 53.8 per cent of the total pig iron. In the first half of this year Bessemer pig iron production was only 4,799,689 tons or 24.5 per cent of the total. Thus the drop was from more than one-half the total pig iron in 1906 to less than one-fourth. Basic iron gained

even more than the Bessemer loss, for the proportion of foundry and malleable iron dropped from 21.6 per cent in 1906 to 18.9 per cent this year.

Outputs of steel ingots and of all pig iron have run very closely together in the past three half-year periods, whereas there used to be substantial divergences at times. In the period of a year and a half the production of ingots was exactly 1.2 times the production of pig iron. In the first half of last year the variation from this proportion was less than one-tenth of one per cent. In the second half of last year ingots ran less than $1\frac{1}{2}$ per cent under the proportion and in the first half of this year less than $1\frac{1}{2}$ per cent above it. Thus pig iron has been a very close index to steel ingot production from time to time and it will probably continue to be so, apart from such long-range swings as are to be expected.

House Organs—Good and Otherwise

EVERY one knows there are more ways to spend advertising appropriations than there are ways of killing a cat. Some are legitimate; others are thinly disguised solicitation for donations. Even if the latter are rigidly excluded it takes a deal of money to establish favorably the name of a firm and its product in the minds of its possible customers. In this effort so-called "direct-by-mail" advertising is one of the plans devised to supplement space in the advertising pages of the periodical press.

Direct-by-mail advertising, as the name implies, requires the production of some attractive literature, to be sent according to plan to the names on a mailing list. Right here it is well to consider the meaning of the words "mailing list." How can one acquire the names of several hundred or several thousand individuals, each one reasonably sure to be interested in the product to be advertised? This is a task indeed. If the article is one required by machinery users, and advertising in machinery papers is bought, the mailing list problem is solved for the advertiser by the publishers of the journals selected. For a manufacturer's own direct-by-mail work mailing lists can be bought, and they also can be constructed from published directories. Such lists cost little and are worth less. The only way known to get a good mailing list of men interested in a certain product is by canvassing by intelligent representatives who discover the individual's interest during a personal interview. Obviously not a cheap process and one that requires continuous effort.

During the time this mailing list problem is being solved, the literature to be sent is also being evolved. Since the repeated appeal is important in advertising, the temptation is strong to issue something periodically—say, once a month—and thus is the "house organ" born. It is published for free circulation among the present and prospective customers of the firm. Once the periodical is started, the doubt is sure to arise sooner or later whether it is sufficiently attractive to the customers, and the temptation is strong to insert jokes, "art" subjects, and general articles on history, mechanics, engineering, business, economics and what not.

The minute the editor of a house organ acquires this idea of attracting the general reader, he should resign and get on the staff of *Harper's*, *Liberty*,

Popular Mechanics, *College Humor*, *Literary Digest*, or whatever else strikes his fancy nearest. For there are magazines a-plenty to take care of every cultural, religious, political, business or technical need the general reader may have. The sole reason for existence for the house organ is to distribute detailed information about a specialized product or process to a selected audience. If only general information is available, no reason for the house organ exists.

As a guide to many friends who may be tempted by the house organ idea, it may be said in summary that three things are required: (a) A definite and precisely stated editorial aim; (b) adequate resources of information and illustration about the problem to be clarified, and (c) an excellent mailing list. With these three, a good job can be done, for the magazine will bring frequently to the reader information which he needs in his business, and there are few who will not take time to read that which will fatten their pocket book. Lacking any one of the above requirements, the house organ will not return the money it costs.

As a final caution, avoid religiously all talk about the house and its methods of doing business. This is the function of space advertising, and is as much out of place in the reading pages of a house organ as paid "write-ups" are in a general medium.

WHILE Germany is particularly under scrutiny in the steel dumping investigation now under way at Washington, it does not follow that Germany is the chief source of steel products now coming into the United States. Steel bars are an important rolled product and in respect to bars the import statistics are given with more detail than is the case with other lines. For the first five months of this year our importations of steel bars were 46,609 tons. By far the largest exporter of bars was Belgium, which sent 24,806 tons, or over 50 per cent of the whole. Germany is credited with 8,215 tons, or 17.5 per cent. There was 6573 tons from France, 4214 tons from Sweden and 1268 tons from British makers. Over 37 per cent of the total bar imports came in at New York and Philadelphia; about 38 per cent was received on the Pacific Coast, and about 6 per cent at Texas and other Gulf ports. Thus it would appear that in steel bars at least Belgium leads in American business, with Germany running a rather poor second.

Canadian Board to Consider Applications for Changes in Import Duties

The Canadian Advisory Board on Tariff and Taxation has announced that it will resume, on Sept. 13, public hearings on applications for changes in import duties and taxes, according to advices to the Department of Commerce from O. B. North, acting commercial attaché, Ottawa.

Sittings are scheduled for Sept. 13, 14, 15, 20, 21, and 22, when further consideration will be given applications for changes in the duties on zirconium oxide; enameled iron or steel ware and all nickel and aluminum hollow-ware; buggies and cutters; motorcycle sidecars and parts; lithographing and printing presses, cutting machines, bronzers, etc.

Foundry Merchandising and Budgets

Speakers at Ohio Foundrymen's Meeting Also Call for Consolidation of Plants and Installation of Labor Saving Equipment.

IMPORTANT merchandising problems were discussed and much information of a practical value to foundrymen was brought out at the seventh annual meeting of the Ohio State Foundrymen's Association held at Cedar Point, Ohio, Aug. 19 and 20.

Of particular interest was that relating to the present condition of the industry brought about by excessive capacity and the shift from gray iron castings to other materials. Speakers declared that gray iron castings are superior to other metals for certain uses and foundrymen should educate the public to their lasting qualities. Improved methods of merchandising castings were also urged. Sand control in the foundry was another subject that attracted considerable interest. The meeting was well attended, there being about 100 members present.

New Officers

C. C. Smith, Toledo Steel Casting Co., was elected president, succeeding Walter L. Seelbach, Cleveland. Don McDaniel, Hamilton Foundry & Machine Co., Hamilton, Ohio, succeeded Mr. Smith as vice-president. Edgar Sands, Superior Gas Engine Co., Springfield, was elected treasurer. Two new members were elected to the board of administration: William Baker, Baker Brothers, Toledo, and A. A. Nolte, Nolte Brass Foundry Co., Springfield.

New Merchandising Methods

"HOW to get business is probably the most important problem before the foundryman today," declared Phil Frankel, secretary Gray Iron Foundry Association, Cleveland, in a talk on "New Merchandising Methods for the Foundry Industry." Foundrymen have not studied merchandising methods in an intensive or cooperative way. Foundries have cut out ruthless competition in the past, but they now have new forms of competition that threaten to destroy the effects of what has been accomplished. Competition has also become keener because of a lessened total of business.

One condition that gray iron foundries did not have to face until a year ago was hand-to-mouth buying. Another condition has been brought about by the fact that there are too many foundries and too much foundry space. In the face of this, the larger users of castings have increased their own foundry capacity. Foundries formerly delivered castings hundreds of miles, but now much of their business comes from nearby. The gray iron foundry industry now has competition from steel and malleable iron foundries and from makers of forgings and steel stampings.

Mr. Frankel declared that gray iron foundries are doing comparatively little to meet the competition of other products. He suggested as a remedy for the present situation the adoption of correct merchandising methods and the elimination of excess foundry space. Present conditions of the market must be studied, he said, and a search made for new markets. New products must be found to manufacture and it will be necessary to develop future markets. Foundrymen must find out how much excess capacity there is and how to get rid of it, by diversion to other uses, or otherwise. Manufacturers who use castings must also be discouraged on putting up foundry additions. Thought should be given to publicity. If three or four foundries in one community could combine, that might help.

James A. Murphy, Hamilton, Ohio, declared that the public should be educated to the lasting qualities of gray iron castings and their superiority for certain

uses. The anti-corrosive qualities of castings should be emphasized to the public.

Selling the public what it ought to buy is one of the biggest things to be accomplished, in the opinion of H. M. Lane, Detroit. He also declared that consolidations of foundries must be effected and equipment must be put in to cut down costs.

Quantity Production Essential

"QUANTITY production is the keynote of our continued prosperity," declared Arnold Lenz, assistant to the general manager in charge of foundries of the Saginaw Products Division, General Motors Corporation, Saginaw, Mich. When prices have been brought down by quantity production, a wide market for them will be created. While there will always be a demand for the jobbing foundry the tendency is toward making castings in production shops.

Malleable foundries are lagging due to the lack of continuous melting systems which permit continuous production. A continuous malleable foundry has been in operation for about a year at the Saginaw plant and Mr. Lenz declared that this is such a success that the remainder of this malleable plant will be changed over to continuous operation as fast as possible. Many malleable castings in the railroad field can be placed on a production basis. Malleable foundries must gradually get away from air furnaces. At the Saginaw plant the iron is melted in a cupola and superheated in an electric furnace. Longer annealing time is required when using the electric furnace, but the annealing cycle has been forced down to 92 hours.

Handling Materials is Largest Part of Foundry Costs

Referring to foundry costs Mr. Lenz said that the cost of making cylinder blocks at the Saginaw plant has been reduced 58 per cent in four years by the use of more mechanical equipment. New equipment is put in not always to try to reduce the costs, but sometimes because skilled labor is scarce. The plant has imported negroes for several years until this year.

The Saginaw foundry has a good rule, he said, not to buy equipment that will not show a return of 30 per cent. He warned foundries against wasting money on minor changes in equipment, declaring that many dissipate their money on little changes so that they have none left to buy important new equipment when it comes out. When considering a new molding machine, remember that the actual molding time is the shortest time of all the molding operations. Consequently at their plant they turned most attention to the handling equipment. With the use of efficient handling equipment in connection with an out of date molding machine built in 1920, they were able to increase the machine production 300 per cent.

In the two Saginaw foundries they are melting 22,000 tons of metal per month and making 14,000 tons of good castings. They watch costs very carefully.

Theoretical costs are figured after a job is lined up and piece work rates are fixed. Then at the end of the month these theoretical costs are compared with actual costs. Theoretical costs of labor are also set up and similar comparisons made.

Maintenance is one of the important items in a foundry. In the Saginaw plant repairs are made immediately when necessary and charged against the cost of castings. When operations are suspended, the plant is shut down tight with no repair men in the building.

Referring to the importance of scrap losses, Mr.

(Concluded on page 515)

Iron and Steel Markets

Steel Industry Is Marking Time

Production Close to a Parity with July—Improvement by
Last Half of September—Pig Iron Prices Hold;
Fuel is Stronger; Scrap Weaker

EXCEPT for the possibility that the heavy tonnage products have shown a little more activity, with the small gain in these lines more in structural shapes than in plates or bars, steel buying remains on the scale of recent weeks,—lots so small that mills have difficulty at times in matching delivery dates with the greatly curtailed rolling schedules.

Eastern Pennsylvania among producing centers reports brighter business, but generally there is a lack of clearly discernible improvement. August will evidently prove close to a parity with July in production. With a number of companies there will be a sharp reduction by Sept. 1 in the amount of unfilled orders.

Consuming industries are buying steadily but the unchanging, meager demand now is forcing a postponement of expectations of expansion until after the middle of September. Signs still are that the betterment will broadly cover all products.

Meanwhile prices are steady. In sheets, the situation is good enough that the expedient of trying to stimulate bookings by setting up an advance for the fourth quarter is not finding favor with the makers. On the other hand, limited competition east and south of Chicago has crystallized in lower plate as well as shape prices, and there is renewed shading in tin plate.

Sheet and tin plate mills are operating at not over 70 per cent of capacity, while wire mills are down to 50 per cent with some of the output probably going into mill stocks. Rail mill operations have tapered to 30 per cent, as not unusual with a buying period five or six weeks away.

Automobile sheet demands are expected to increase by mid-September. Added evidence of low stocks in users' hands has come in the closing of several third-quarter contracts for strip steel.

Railroad car builders face sharp curtailment, for even were a bulge in car purchasing in prospect, there is the time factor to consider of getting into production.

Fabricated steel has shown a falling off in bookings, the 17,000 tons being considerably below the recent weekly average. Of fresh projects, taking upward of 35,000 tons, 10,000 tons is for a power plant at Hammond, Ind., 4800 tons for a viaduct in Newark, N. J., and 3500 tons for an office building in Houston, Tex.

In the pig iron market the use of water routes is accentuating competition. Sales of 8000 tons in the Chicago district have been made against three cargoes to be shipped by Lake from Cleveland.

Bookings for the week by Cleveland furnaces, at 30,000 tons, show a drop of 20,000 tons from the total of a week ago, and sales have declined in other districts with the exception of St. Louis, where 25,000 tons was sold. Inquiry has also subsided, although an Eastern radiator company has entered the market for 6000 tons and a sanitary ware manufacturer has asked for figures on 5000 tons. Prices, which are at a low level, have given no further ground.

Stove and furnace makers in Michigan are increasing their melt, and automotive foundries are preparing to expand operations.

Coke, although not in active demand, has been favorably affected by a stronger coal market. Western Kentucky and West Virginia mines are being drawn on by Western railroads, which have been unable to obtain full supplies of coal from their usual sources. They are also benefiting from a Middle Western demand for household fuel. Imports of nearly 9000 tons of coal at Boston in the first half of August reflect the tightening of domestic supplies.

Scrap, which has been getting its main support from dealer purchases, has a weaker tone. At Chicago, heavy melting scrap has declined 50c. a ton, and at Cleveland and Boston the market has softened. At Pittsburgh, dealers are still paying more for material than consumers will pay, while at Philadelphia prices are finding support in the reduced rate of scrap output.

Exports of iron and steel in July, at 190,502 gross tons, were higher than the 184,364 tons of June but lower than 194,717 tons of July, 1926. Imports were 61,172 tons in July. Except for last February and April, this is the smallest incoming tonnage since December, 1924. The June total was 69,017 tons; that for July, 1926, was 82,411 tons.

Foundry and forge grades of British pig iron from the Cleveland district have been reduced \$1.20 a ton on export orders exceeding 500 tons, bringing quotations to \$15.50 to \$15.75 at makers' works. The British competition has been felt in Montreal, where also American iron has sold \$1 a ton below Canadian quotations.

To prevent the sale of foreign steel plates and structural shapes as American made, Seattle requires the stenciling of the name of the maker on the material.

Both of THE IRON AGE composite prices are unchanged again this week, that for pig iron remaining at \$18.13 (its low of several years) for the third week and that for finished steel at 2.367c. a lb. for the eleventh week.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Aug. 23, 1927	Aug. 16, 1927	July 26, 1927	Aug. 24, 1926
No. 2, fdy., Philadelphia...	\$20.76	\$20.76	\$20.76	\$21.76
No. 2, Valley furnace....	17.50	17.50	18.00	17.50
No. 2, Southern, Cin'ti....	20.94	20.94	20.94	24.19
No. 2, Birmingham.....	17.25	17.25	17.25	21.00
No. 2 foundry, Chicago*...	19.50	19.50	20.00	21.00
Basic, del'd eastern Pa....	20.00	20.00	20.75	21.00
Basic, Valley furnace....	17.25	17.25	17.50	17.50
Valley Bessemer, del. P'gh	20.26	20.26	20.26	19.76
Malleable, Chicago*.....	19.50	19.50	20.00	21.00
Malleable, Valley	17.50	17.50	18.00	17.50
Gray forge, Pittsburgh....	18.76	18.76	19.26	18.76
L. S. charcoal, Chicago....	27.04	27.04	27.04	29.04
Ferromanganese, furnace.	90.00	90.00	90.00	88.00

Rails, Billets, etc., Per Gross Ton:	Aug. 23, 1927	Aug. 16, 1927	July 26, 1927	Aug. 24, 1926
O.-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	34.00
Bess. billets, Pittsburgh..	33.00	33.00	33.00	35.00
O.-h. billets, Pittsburgh..	33.00	33.00	33.00	35.00
O.-h. sheet bars, P'gh....	34.00	34.00	34.00	36.00
Forging billets, P'gh....	39.00	39.00	39.00	40.00
O.-h. billets, Phila.....	38.30	38.30	38.30	40.30
Wire rods, Pittsburgh....	43.00	43.00	43.00	45.00
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.90

Finished Iron and Steel,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.12	2.22	
Iron bars, Chicago.....	2.00	2.00	2.00	2.00	
Steel bars, Pittsburgh....	1.80	1.80	1.80	2.00	
Steel bars, Chicago.....	2.00	2.00	2.00	2.10	
Steel bars, New York....	2.14	2.14	2.14	2.34	
Tank plates, Pittsburgh..	1.80	1.80	1.80	1.90	
Tank plates, Chicago....	1.90	2.00	2.00	2.10	
Tank plates, New York...	2.09	2.09	2.09	2.24	
Beams, Pittsburgh	1.80	1.80	1.80	2.00	
Beams, Chicago	1.90	1.90	2.00	2.10	
Beams, New York.....	1.95	1.95	2.04	2.34	
Steel hoops, Pittsburgh..	2.30	2.30	2.30	2.50	

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	Aug. 23, 1927	Aug. 16, 1927	July 26, 1927	Aug. 24, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	3.00	3.00	3.00	2.95
Sheets, black, No. 24, Chi-				
cago dist. mill.....	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, P'gh	3.85	3.85	3.85	3.80
Sheets, galv., No. 24, Chi-				
cago dist. mill.....	3.95	3.95	3.95	3.95
Sheets, blue, 9 & 10, P'gh	2.25	2.25	2.25	2.30
Sheets, blue, 9 & 10, Chi-				
cago dist. mill.....	2.35	2.35	2.35	2.40
Wire nails, Pittsburgh....	2.55	2.55	2.55	2.65
Wire nails, Chicago dist.				
mill	2.60	2.60	2.60	2.70
Plain wire, Pittsburgh....	2.40	2.40	2.40	2.50
Plain wire, Chicago dist.				
mill	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh..	3.25	3.25	3.25	3.35
Barbed wire, galv., Chi-				
cago dist. mill.....	3.30	3.30	3.30	3.40
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	Aug. 23, 1927	Aug. 16, 1927	July 26, 1927	Aug. 24, 1926
Heavy melting steel, P'gh.	\$15.50	\$15.50	\$15.25	\$17.50
Heavy melting steel, Phila.	14.00	14.00	13.00	16.50
Heavy melting steel, Ch'go	12.00	12.50	12.25	14.00
Carwheels, Chicago	14.50	14.50	14.50	16.00
Carwheels, Philadelphia ..	15.50	15.50	15.00	17.50
No. 1 cast, Pittsburgh....	15.00	15.00	15.00	17.00
No. 1 cast, Philadelphia..	16.00	16.00	16.00	18.00
No. 1 cast, Ch'go (net ton)	14.75	14.75	14.50	17.00
No. 1 RR. wrot, Phila....	15.50	15.50	15.50	18.00
No. 1 RR. wrot, Ch'go (net)	11.50	11.50	11.75	13.50

Coke, Connellsville,	Per Net Ton at Oven:	Aug. 23, 1927	Aug. 16, 1927	July 26, 1927	Aug. 24, 1926
Furnace coke, prompt....	\$3.00	\$3.00	\$3.00	\$3.00	
Foundry coke, prompt....	4.00	4.00	4.00	4.00	

Metals,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	13.25	13.50	13.00	14.50	
Electrolytic copper, refinery	12.87 1/2	13.00	12.75	14.12 1/2	
Zinc, St. Louis.....	6.32 1/2	6.37 1/2	6.35	7.40	
Zinc, New York.....	6.67 1/2	6.72 1/2	6.70	7.80	
Lead, St. Louis.....	6.30	6.40	6.35	8.75	
Lead, New York.....	6.65	6.75	6.50	8.90	
Tin (Strait), New York...	63.75	64.37 1/2	63.75	65.00	
Antimony (Asiatic), N. Y.	11.62 1/2	12.00	12.50	16.00	

Pittsburgh

Steel Demand Shows No Gain—Coal Market Is More Active

PITTSBURGH, Aug. 23.—If there has been any change in the characteristics and tendencies of the steel market since a week ago, it is not apparent. The general report still is that orders and specifications are for small tonnages for prompt shipment, and productive activities as measured by ingot output are practically where they have been for the past two weeks, or about 65 per cent of capacity in Pittsburgh and nearby districts. All manufacturers could do more business than they are doing, and there is not a finished steel product on which the mills cannot meet the exacting delivery requirements of buyers.

The heavy tonnage products, taken collectively, have sold with a little more freedom in the past week than in the week before, but structural shapes have furnished more of the gain than plates and bars. Large users of the latter are buying very sparingly, in keeping with the fact that demands upon them, notably from the motor car builders, have rarely been lighter than in the past few weeks.

In a general way, demand lacks the spontaneity that accompanies either reasonably full engagement of consumptive capacity or a confident feeling as to the immediate future. The record of the last half of each month in sales, especially in these days of short-term buying, usually is a reliable guide as to the productive activities of the ensuing month; since the third week of August has not materially bettered the first two in

point of bookings, the coming week will have to do particularly well if early September is going to show much increase in steel output.

Steel prices are generally steady, but in a market such as the present one, competition in prices usually gives way to one in deliveries. Buyers still seek to avoid adding to their inventories, and their purchases naturally reflect actual needs, which must be promptly supplied. Producers, therefore, are more likely to lose orders on inability to make the deliveries wanted than because of prices. Economical scheduling of rolling mills remains the serious problem of the steel producers.

The pig iron market has been awakened by an inquiry for fourth quarter foundry iron from the largest individual user of that grade in this district, for while the formal request for prices mentions only a small tonnage, total purchases by this interest may well mount to 20,000 tons.

The coal market is beginning to show some signs of the effect of the union mine suspension. Western railroads, unable to secure accommodation from mines in Indiana and Illinois, which they serve, have been drawing from western Kentucky mines, which also are benefiting from the winter stocking demands of Middle Western householders. Lately a considerable movement of coal from West Virginia into the Middle West has been noted. Prices are stiffer than they have been in both of those districts, and wages are advancing in western Kentucky mines. But more important in its bearing on the situation in this part of the country is the fact that, on account of the longer distances that coal is moving, there is the threat of car shortages, which may hamper a resumption of operations at idle non-union mines a little later on when the full weight of fall and winter demands for coal is felt. Little con-

cern has been felt locally about the coal situation, because of ample stocks and the fact that it was believed that a good deal of open shop production would become available when there was a market for it.

Pig Iron.—Actual business in pig iron is still light, because consumers generally are well supplied or covered on such requirements as they now have. The Standard Sanitary Mfg. Co. has sent out an inquiry for 2000 to 5000 tons of No. 2 and No. 2X foundry iron for fourth quarter delivery, but the common impression is that its actual purchases will run considerably larger than that, since, in addition to the requirements for its plants at Pittsburgh and New Brighton, Pa., it no doubt will buy for those at Louisville, Ky., and Baltimore. Its last purchases were merely for the present quarter. There is much speculation as to the prices this inquiry will develop. The market lately has been quotable at \$17.50, Valley furnace, for No. 2 foundry in lots of more than a carload, but producers insist that they are losing money at that price and, in some cases, the only excuse for keeping furnaces in blast is to liquidate the ore. A few other small fourth quarter inquiries for foundry iron have come out in the past week but, in general, interest in the market on the part of melters is low. No sales of basic iron are noted, and those of other grades have been largely single carloads. The Pittsburgh Crucible Steel Co. recently started up one of its blast furnaces, which had been banked.

Prices per gross ton, f.o.b. Valley furnace:

Basic	\$17.25 to \$17.50
Bessemer	18.50
Gray forge	17.00 to 17.50
No. 2 foundry	17.50 to 18.00
No. 3 foundry	17.00 to 17.50
Malleable	17.50 to 18.00
Low phosphorus, copper free....	27.50 to 28.00

Freight rate to the Pittsburgh or Cleveland district, \$1.76.

Ferroalloys.—Specifications against contracts for the commonly used ferroalloys are in keeping with the present rate of steel works operations, which range from 60 to 70 per cent of capacity. Most of the contracts cover the requirements of buyers rather than a definite tonnage monthly. There is little or no new business. Prices are unchanged.

Semi-Finished Steel.—There is no apparent increase in the demand for billets, slabs and sheet bars. Indeed, it is still difficult for makers to get buyers to release tonnages. Sheet and tin plate mills are not operating over 70 per cent of capacity, and strip steel makers completed second quarter contracts several weeks ago and since then have not been getting orders of such size as to necessitate free specifications against billet and slab orders. A quiet market in wire products and pipe operates against activity in rods and skelp, and forging steel reflects the rather low rate of operation of the automotive industry. Prices are steady.

Wire Products.—This is ordinarily a quiet consumptive period and the present time is proving no exception to the rule. In these times of short-term buying, fluctuations in demand are quickly reflected by mill operations, because there is not much stock between

the mills and ultimate consumers. The demand does not now warrant high mill engagement, and even at the present rate of approximately 50 per cent of capacity there is some adding to mill stocks. Prices are steady but not subject to much test, because of the ample coverage given consumers and jobbers before the present schedule was established.

Rails and Track Supplies.—Business generally is dull with producers in this district, and outside of the Chesapeake & Ohio inquiry for standard-section rails and for spikes and tie plates, mills do not expect much business until the 1928 rail requirements begin to reach the market late next month or early in October. Prices on track accessories are steady but largely untested. It is so long since standard-section rails have changed in price that the quotations have come to be regarded as fixtures.

Tubular Goods.—Little variation is noted from week to week in the demand for pipe. Butt welded pipe is moving steadily enough, and here and there is found evidence of some increase in specifications in preparation for fall heating demands. Shipments for the year to date are about 10 per cent smaller than in the same period last year. The loss runs heavier in lapwelded pipe, for while bookings of line pipe have been well up to those of last year, there has been a heavy loss in shipments of drill and drive pipe and casing and the demand for those lines is still light. There is a fair demand for merchant boiler tubes and for mechanical tubing for automobile axle housings and bumpers.

Sheets.—Leading consuming industries are taking sheets steadily but are taking good care not to add to their inventories. Very prompt shipment is demanded on all orders and while this suggests low stocks in consumers' hands, it is not taken to indicate any immediate expansion in purchases. Manufacturers need heavier order books to be in a position to resist the short notice prompt delivery demands of buyers, and since total demands are sufficient to engage only about 70 per cent of capacity, they cannot ignore such demands. Prices are well maintained.

Tin Plate.—No improvement can be reported in tin plate business. While there is a good movement of general line tin plate, that for perishable food containers is still slow both in terms of new orders and specifications. The pack of peas, corn and tomatoes, according to late estimates, will fall considerably below that of last year and will show an even greater loss as compared with the 1925 pack. Weather conditions have not been favorable, and a considerably smaller acreage was planted in the effort to reduce the carryover from the 1926 pack. Pacific Coast advices are that salmon are not running as early as usual this year and that the pack will be smaller as a result of a shorter season. Packers and peach growers have compromised their differences as to prices to be paid for the fresh fruit. A sliding scale basis has been agreed upon whereby growers will get \$20 a ton in case the pack is 13,000,000 cases or more, \$5 a ton more in case it is 11,000,000 cases and \$10 a ton more if it amounts to 9,000,000 cases.

THE IRON AGE Composite Prices

Finished Steel Aug. 23, 1927, 2.367c. a Lb.

One week ago.....	2.367c.
One month ago.....	2.367c.
One year ago.....	2.431c.
10-year pre-war average.....	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

High			Low		
1927	2.453c.	Jan. 4:	2.339c.	April 26	
1926	2.453c.	Jan. 5:	2.403c.	May 18	
1925	2.560c.	Jan. 6:	2.396c.	Aug. 18	
1924	2.789c.	Jan. 15:	2.460c.	Oct. 14	
1923	2.824c.	April 24:	2.446c.	Jan. 2	

Pig Iron Aug. 23, 1927, \$18.13 a Gross Ton

One week ago.....	\$18.13
One month ago.....	18.42
One year ago.....	19.46
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

High			Low		
1927	\$19.71,	Jan. 4:	\$18.13,	Aug. 9	
1926	21.54,	Jan. 5:	19.46,	July 13	
1925	22.50,	Jan. 13:	18.96,	July 7	
1924	22.88,	Feb. 26:	19.21,	Nov. 3	
1923	30.86,	March 20:	20.77,	Nov. 20	

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.80c.
F.o.b. Chicago.....	2.00c.
Del'd Philadelphia.....	2.12c.
Del'd New York.....	2.14c.
Del'd Cleveland.....	1.99c.
F.o.b. Cleveland.....	1.80c. to 1.85c.
F.o.b. Birmingham.....	1.95c. to 2.05c.
C.i.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....	1.80c. to 1.90c.
F.o.b. Birmingham.....	1.95c. to 2.05c.

Rail Steel

F.o.b. mill.....	1.65c. to 1.80c.
F.o.b. Chicago.....	1.90c.

Iron

Common iron, f.o.b. Chicago.....	2.00c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.75c. to 1.80c.
F.o.b. Chicago.....	1.90c. to 2.00c.
F.o.b. Birmingham.....	1.90c. to 2.00c.
Del'd Cleveland.....	1.99c.
Del'd Philadelphia.....	2.07c. to 2.12c.
Del'd New York.....	2.09c. to 2.14c.
C.i.f. Pacific ports.....	2.30c. to 2.40c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.75c. to 1.80c.
F.o.b. Chicago.....	1.90c. to 2.00c.
F.o.b. Birmingham.....	1.90c. to 2.00c.
Del'd Cleveland.....	1.99c.
Del'd Philadelphia.....	1.90c. to 2.02c.
Del'd New York.....	1.90c. to 2.04c.
C.i.f. Pacific ports.....	2.35c. to 2.40c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh.....	2.30c.
All gages, 6 in. to 12 in., P'gh.....	*2.10c.
Nos. 13 and 14 gage, 12 in. to 14 in., P'gh, net.....	2.30c.
Nos. 15 and 16 gage, 12 in. to 14 in., P'gh, net.....	2.40c.
All gages, narrower than 6 in., Chicago, 2.40c. to 2.60c.	
All gages, 6 in. and wider, Chicago.....	2.20c. to 2.50c.

Cotton ties, per bundle 45-lb. out of stock, f.o.b. Atlantic ports.....	\$1.21
Cotton ties, per bundle 45-lb. out of stock, f.o.b. Gulf ports.....	\$1.20

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills.....	2.20c. to 2.30c.
Bars, f.o.b. Chicago.....	2.30c.
Bars, Cleveland.....	2.30c. to 2.35c.
Shafting, ground, f.o.b. mill.....	*2.45c. to 2.90c.
Strips, under 12 in., f.o.b. P'gh mill.....	3.25c.
Strips, under 12 in., f.o.b. Cleveland mills.....	3.25c.
Strips, under 12 in., delivered Chicago.....	3.55c.
Strips, under 12 in., f.o.b. Worcester mill.....	3.40c.
Strip-sheets, 12 in. and wider, Pittsburgh mill.....	3.00c.
Strip-sheets, 12 in. and wider, Cleveland mill.....	3.00c.
Strip-sheets, 12 in. and wider, del'd Chicago.....	3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.55
Galvanized nails.....	4.55
Galvanized staples.....	3.25
Polished staples.....	3.00
Cement coated nails.....	2.55

	Base Per 100 Lb.
Bright plain wire, No. 9 gage.....	\$2.40
Annealed fence wire.....	2.55
Spring wire.....	3.40
Gal'd wire, No. 9.....	3.00
Barbed wire, gal'd.....	3.25
Barbed wire, painted.....	3.00

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh.....	2.25c.
Nos. 9 and 10, f.o.b. Chicago dist. mill.....	2.35c.
Nos. 9 and 10, del'd Philadelphia.....	2.57c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.40c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	3.00c.
No. 24, f.o.b. Ch'go dist. mill.....	3.10c.
No. 24, del'd Philadelphia.....	3.32c.
No. 24, f.o.b. Birmingham.....	3.15c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.....	4.15c.
No. 24, f.o.b. Pittsburgh, B grade.....	3.95c.

Galvanized

No. 24, f.o.b. Pittsburgh.....	3.85c.
No. 24, f.o.b. Chicago dist. mill.....	3.95c.
No. 24, del'd Philadelphia.....	4.17c.
No. 24, f.o.b. Birmingham.....	4.00c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	3.00c. to 3.10c.
No. 28, f.o.b. Chicago dist. mill.....	3.20c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.25c.
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Long Ternes

No. 24, 8-lb. coating, f.o.b. mill.....	4.20c. to 4.30c.
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Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.....	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating I.C. \$11.48	25-lb. coating I.C. \$17.30
15-lb. coating I.C. 14.45	30-lb. coating I.C. 18.75
20-lb. coating I.C. 15.80	40-lb. coating I.C. 20.85

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago or Ohio Mill)

S. A. E. Series

Numbers	Base Per 100 Lb.
2100* (1/2% Nickel, 0.10% to 0.20% Carbon).....	\$2.90 to \$3.00
2300 (3/4% Nickel).....	4.10 to 4.20
2500 (5% Nickel).....	5.00 to 5.25
3100 (Nickel Chromium).....	3.10 to 3.20
3200 (Nickel Chromium).....	4.75 to 5.00
3300 (Nickel Chromium).....	6.75 to 7.00
3400 (Nickel Chromium).....	6.00 to 6.25
5100 (Chromium Steel).....	3.10 to 3.20
5200* (Chromium Steel).....	7.00 to 7.50
6100 (Chrom. Vanadium bars).....	4.10 to 4.30
6100 (Chrom. Vanad. spring steel).....	3.60 to 3.80
9250 (Silicon Manganese spring steel).....	3.00 to 3.15

Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.).....	4.10 to 4.20
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.).....	4.10 to 4.30
Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.).....	4.00 to 4.25
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.).....	3.20 to 3.30
Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum).....	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2 1/2-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	26.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Ch'go mill.....	\$36.00 to \$38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, 3/4 in. and larger.....	\$2.80 to \$2.90
Spikes, 1/2 in. and smaller.....	2.80 to 3.00
Spikes, boat and barge.....	3.10
Tie plates, steel.....	2.85
Angle bars.....	2.75
Track bolts, 1 1/2 in. and 3/4 in.....	3.90
Track bolts, 3/4 in. and smaller, per 100 count.....	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld			Lap Weld		
Inches	Steel	Iron	Inches	Steel	Iron
1/2	45	19 1/2	1/4 to 3/8	+11	+89
3/4	51	25 1/2	3/8	22	2
1	56	42 1/2	3/4	28	11
1 1/4	60	48 1/2	1 to 1 1/4	30	13
1 1/2 to 3	62	50 1/2			
2	55	43 1/2	2	23	7
2 1/2 to 6	59	47 1/2	2 1/2	26	11
7 and 8	56	43 1/2	3 to 6	28	13
9 and 10	54	41 1/2	7 to 12	26	11
11 and 12	53	40 1/2			

Butt Weld, extra strong, plain ends			Lap Weld, extra strong, plain ends		
1/2	41	24 1/2	1/4 to 3/8	+19	+54
3/4	47	30 1/2	3/8	21	17
1	53	42 1/2	3/4	28	12
1 1/4	58	47 1/2	1 to 1 1/4	30	14
1 1/2 to 3	60	49 1/2			
2 to 3	61	50 1/2			

2	53	42 1/2	2	23	9
2 1/2 to 4	57	46 1/2	2 1/2 to 4	29	15
4 1/2 to 6	56	45 1/2	4 1/2 to 6	28	14
7 to 8	52	39 1/2	7 to 8	21	15
9 and 10	45	32 1/2	9 to 12	16	2
11 and 12	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1 1/2 points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2 1/2%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2 1/4 in.....	27	1 1/2 in.....	+18
2 1/4 to 2 1/2 in.....	37	1 1/2 to 1 3/4 in.....	+8
3 in.....	40	2 to 2 1/4 in.....	2
3 1/4 to 3 1/2 in.....	42 1/2	2 1/2 to 3 in.....	7
4 to 13 in.....	46	3 1/2 to 4 1/2 in.....	9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn		Hot Rolled	
1 in.....	60	3 in.....	45
1 1/4 to 1 1/2 in.....	62	3 1/4 to 3 1/2 in.....	47
1 1/2 in.....	66	4 in.....	50
2 to 2 1/4 in.....	31	4 1/2, 5 and 6 in.....	45
2 1/4 to 2 1/2 in.....	39		

2 and 2 1/4 in.....	37	3 1/4 and 3 1/2 in.....	53
2 1/2 and 2 3/4 in.....	45	4 in.....	56
3 in.....	51	4 1/2, 5 and 6 in.....	51

Less earloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.20%, base.....	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 15 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.	

Cold-Finished Steel Bars and Shafting.—The lack of the usual amount of business from the automobile parts makers is not made good by fairly good demands from other consuming industries, and business as a whole is quiet. The effort is still being made to reestablish 2.30c., base Pittsburgh, as the ordinary tonnage price, but there is too much competition for it to be completely successful.

Hoops, Bands and Strips.—Demand is still largely supplementary in character, as few consumers have entirely used up material shipped against second quarter contracts and consequently are able to get along with fill-in purchases. Only a few of the automobile builders are on quantity production schedules, and orders from that industry are only moderately large. Makers are holding firm to 2.10c., base, for wide hot-rolled strips, 2.30c., base, for narrow strips and hoops and bands, 3.25c., base, for cold-rolled strips and 3c., base, for strip sheets.

Plates.—It is easy to get small tonnages at 1.80c., base Pittsburgh, because most makers want orders to round out rolling mill schedules. Demand is moderate, and few inquiries of any considerable size are coming on the market.

Structural Steel.—Mills here are asking and getting 1.80c., base Pittsburgh, but only for small tonnages for local shipment. On lots of more than 100 tons 1.75c. is reported, and on the really sizable tonnages the price remains a matter for private negotiation. Structural awards are light, but local fabricators report a good volume of inquiry and activity in their engineering departments.

Steel and Iron Bars.—Reduced demand from makers of cold-finished bars and shafting leaves more tonnage of hot-rolled bars for jobbers, fabricators and other consuming industries to take than they can handle at present. As a result, most mills still need business. While 1.80c., base, can be done easily on ordinary tonnages down to a carload, there are no suggestions of lower prices for large lots or that contracts written at that price have been revised. Most of the business offered consists of small lots for early shipment, and 1.80c., base Pittsburgh, seems satisfactory to both buyers and sellers. Steel bar mill operations are not more than 60 per cent in this and nearby districts. Iron bars are steady at 2.75c., base Pittsburgh, but demand is light.

Bolts, Nuts and Rivets.—Demand is steady enough but, as is true in all steel products, it is for small lots for early delivery, there being no tendency by either jobbers or consumers to anticipate their needs. Deviations from quotations are infrequent.

Coke and Coal.—The coal market tends to gain in strength as a result of increasing demands for domes-

tic coal and lessening competition in this market from the surplus production of the West Virginia field, which largely has gone west to supply Western roads unable to get full supplies from their usual sources. Prices are higher on slack coal, Western demand for which is strong, but other grades hold at recent prices. Spot furnace coke is not in active demand, but not much is offered in view of an improved market for coal and heating coke at more remunerative prices. Spot foundry coke is in fair demand, with prices holding at about last week's levels.

Old Material.—The market still is a two-sided affair, since dealers who figure that there must soon be a recovery in steel works operations and a consequent increase in the demand for scrap are inclined to back their judgment by paying more for supplies than can be obtained from consumers. The mill or consumer market is held in check by rather limited interest in supplies. It is hard to sell heavy melting steel in the Pittsburgh district at more than \$15.50, and \$15 is still the bid of one company that seems to be willing to take on supplies. Machine shop turnings are weaker in both dealer and mill bids.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel.....	\$15.25 to \$15.75
Scrap rails	14.50 to 15.00
Compressed sheet steel.....	14.50 to 15.00
Bundled sheets, sides and ends...	13.50 to 14.00
Cast iron carwheels.....	15.00 to 15.50
Sheet bar crops, ordinary.....	15.50 to 16.00
Heavy breakable cast.....	14.75 to 15.25
No. 2 railroad wrought.....	15.25 to 15.75
Heavy steel axle turnings.....	14.00 to 14.50
Machine shop turnings.....	11.50 to 12.00
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers...	16.75 to 17.25
Railroad coil and leaf springs...	16.75 to 17.25
Rolled steel wheels.....	16.75 to 17.25
Low phosphorus billet and bloom ends	20.00 to 20.50
Low phosphorus, mill plate.....	19.50 to 20.00
Low phosphorus, light grade.....	17.00 to 17.50
Low phosphorus sheet bar crops...	19.00 to 19.50
Heavy steel axle turnings.....	14.00 to 14.50
Electric Furnace Grades:	
Low phosphorus punchings.....	17.00 to 17.50
Heavy steel axle turnings.....	14.00 to 14.50
Blast Furnace Grades:	
Short shoveling steel turnings...	12.00 to 12.50
Short mixed borings and turnings	11.00 to 11.50
Cast-iron borings	11.00 to 11.50
No. 2 busheling.....	10.25 to 10.75
Rolling Mill Grades:	
Steel car axles.....	19.00 to 20.00
No. 1 railroad wrought.....	12.00 to 12.50
Cupola Grades:	
No. 1 cast.....	15.00 to 15.50
Rails 3 ft. and under.....	16.00 to 16.50
Malleable Grades:	
Railroad	15.25 to 15.75
Industrial	14.75 to 15.25
Agricultural	14.25 to 14.75

Warehouse Prices, f.o.b. Pittsburgh

	Base per lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes.....	2.90c.
Reinforcing steel bars.....	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons.....	3.60c.
Squares and flats.....	4.10c.
Bands	3.60c. to 3.65c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.60c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.30c.
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, ¾ in. and smaller, per 100 count, 62½ per cent off list	
Machine bolts, per 100 count. 62½ per cent off list	
Carriage bolts, per 100 count. 62½ per cent off list	
Nuts, all styles, per 100 count, 62½ per cent off list	
Large rivets, base per 100 lb.....	\$3.50
Wire, black soft annealed, base per 100 lb...	2.90
Wire, galvanized soft, base per 100 lb.....	2.90
Common wire nails, per keg.....	\$2.80 to 2.90
Cement coated nails, per keg.....	2.85 to 2.95

Mining and Concentrating Fluorspar

A bulletin (No. 244) has been issued by the Bureau of Mines dealing primarily with the mining and concentration of fluorspar, and a detailed description of known American deposits. Since its principal use is for a flux in basic open-hearth furnaces, the United States consumes more than three-fourths of the world's production. Mines in Illinois and Kentucky are the principal producers; they have but limited reserves unmined. United States production is about 110,000 tons annually and imports are 50,000 tons in addition. Bulletin 244 may be purchased from the Superintendent of Documents, Government Printing Office, Washington, for 35c.

The Algoma Steel Corporation, Ltd., Sault Ste. Marie, Ont., subsidiary of the Lake Superior Corporation, reports net loss for the year ended June 30, 1927, of \$251,248 after interest charges, etc., compared with a loss of \$638,759 in the previous fiscal year.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over.....	\$33.00
Rerolling, under 4-in. to and including 1½-in.	\$33.50 to 34.00
Forging, ordinary	39.00 to 40.00
Forging, guaranteed	44.00 to 45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer.....	\$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger.....	\$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.80c.
Sheared	1.80c.
Universal	1.80c.

Wire Rods

	Per Gross Ton
*Common soft, base.....	\$43.00
Screw stock	\$5.00 per ton over base
Carbon 0.20% to 0.40% ..	3.00 per ton over base
Carbon 0.41% to 0.55% ..	5.00 per ton over base
Carbon 0.56% to 0.75% ..	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is \$44. Cleveland mill base, \$43.

Prices of Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15
Foreign Ore, c.i.f. Philadelphia or Baltimore	Per Unit

Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria.....	10.50c.
Iron ore, Swedish, average 66% iron, 9.75c. to 10.00c.	

Manganese ore, washed, 52% manganese, from the Caucasus.....	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50%	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates	\$10.50 to \$10.75

Chrome ore, 45 to 50% Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard.....	\$22.00 to \$24.00
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Molybdenum ore, 85% concentrates of MoS ₂ , delivered	50c. to 55c.
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Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	\$3.00 to \$3.25
Foundry, f.o.b. Connellsville prompt	4.00 to 4.50
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered	9.59 to 10.77
Foundry, Birmingham	5.50
Foundry, by-product, St. Louis....	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.60 to 1.90
Mine run gas coal, f.o.b. Pa. mines ..	1.90 to 2.00
Steam slack, f.o.b. W. Pa. mines..	1.15 to 1.25
Gas slack, f.o.b. W. Pa. mines....	1.35 to 1.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd.....	\$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid	90.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	\$33.00 to \$34.00
Domestic, 16 to 19%	32.00 to 33.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	\$85.00 to \$87.50
75%	145.00

Per Gross Ton Furnace		Per Gross Ton Furnace	
10%	\$35.00	12%	\$39.00
11%	37.00	14 to 16% ..	\$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County,*Ohio, Furnace			
Per Gross Ton		Per Gross Ton	
10%	.....\$34.00	12%	.....\$38.00
11%	.....36.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace			
Per Gross Ton		Per Gross Ton	
6%	.....\$26.50	10%	.....\$32.00
7%	.....27.50	11%	.....34.00
8%	.....28.50	12%	.....36.00
9%	.....30.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	95c. to \$1.05
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	\$3.15 to \$3.65
Ferrocobaltitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton.....	\$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton.....	\$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$17.00
No. 2 lump, Illinois and Kentucky mines..	\$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid.....	\$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines.....	\$32.50

Fire Clay

	Per 1000 f.o.b. Works
First Quality	
Second Quality	
Pennsylvania ...	\$43.00 to \$46.00 \$35.00 to \$38.00
Maryland	43.00 to 46.00 35.00 to 38.00
New Jersey ...	50.00 to 65.00
Ohio	43.00 to 46.00 35.00 to 38.00
Kentucky	43.00 to 46.00 35.00 to 38.00
Missouri	43.00 to 46.00 35.00 to 38.00
Illinois	43.00 to 46.00 35.00 to 38.00
Ground fire clay, per ton	7.00

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton.....	\$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	\$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

	Per 100 Pieces
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
Per Cent Off List	
1 Machine bolts	70
1 Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	70
Hot-pressed nuts, blank or tapped, square....	70
Hot-pressed nuts, blank or tapped, hexagon....	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled threads up to and including ½ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts.....	70
Semi-finished hexagon castellated nuts, S.A.E. ..	70
Stove bolts in packages.....	80, 10 and 5
Stove bolts in bulk.....	80, 10, 5 and 2½
Tire bolts	60 and 5

Large Rivets

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland.....	\$2.75 to \$3.00
F.o.b. Chicago	2.85 to 3.10

Small Rivets

	Per Cent Off List
(½-In. and Smaller)	
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)	
Per Cent Off List	
Milled cap screws.....	80, 10 and 10
Milled standard set screws, case hardened, 80 and 10	
Milled headless set screws, cut thread.....	80
Upset hex. head cap screws, U.S.S. thread, 85 and 5	
Upset hex. cap screws, S.A.E. thread.....	85 and 5
Upset set screws.....	80, 10 and 10
Milled studs	70 and 5

Chicago

Gary Stack Put Out—Three Cargoes of Pig Iron to be Shipped from Cleveland

CHICAGO, Aug. 23.—Production of steel works pig iron has been further reduced in this district by the blowing out this week of a furnace at Gary, leaving seven active at that plant. Six stacks remain in blast at South Chicago and one at Joliet, making the total active furnaces at Steel Corporation works 14 out of 27. Counting all steel works furnaces in this area, 22 out of 36 are in blast.

The reduction in pig iron production is but a further indication of the tendency of the steel market as a whole. Individual orders are small and deliveries are so unsatisfactory in many cases that users are turning to warehouses for a larger portion of their requirements. Although there is some promise that a rail buying program will get under way at an early date, it is apparent that railroads are not showing the interest of a year ago at this time, when one rail mill had a fairly accurate lineup on 30 to 40 per cent of the rails that it expected to roll during the fall and winter months.

Mill prices on plates, shapes and bars are sagging more in outlying districts than in Chicago, as a result of competition from the East and increased pressure on the part of all producers to take business to round out rolling schedules.

Cast iron pipe producers' bookings are small and out of balance. Heavy shipments against past obligations in a dull market have resulted in a quotation in Chicago of \$28, Birmingham, or \$2 a ton below the previous low bid at Milwaukee.

Pig Iron.—Fresh inquiry is markedly lower than last week, and sales are confined to individual orders calling for less than 500 tons each. On the other hand, shipments are holding to the rate attained early in the month, probably indicating a rounding out of stocks at foundries rather than an enlarged demand for castings. The bulk of foundry iron in this district is being sold at \$19.50, furnace, by local producers. Reports are insistent, however, that one seller has taken orders in Chicago and Milwaukee at a price of close to \$19, delivered, for boat iron which is to be shipped from Cleveland. It is probable that orders have been taken for between 7000 and 8000 tons, which will be shipped here in three cargoes. The silvery market is quiet, with prices unchanged. Several small sales of charcoal iron are reported at \$24, furnace, or \$27.04, delivered. Merchant pig iron production is steady, and at the moment shipments are such that furnace stocks are not growing.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$19.50
N't'n No. 1 fdy., sil. 2.25 to 2.75	20.00
Malleable, not over 2.25 sil.	19.50
High phosphorus	19.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	23.26
Southern No. 2 (barge and rail)	21.43
Low phos., sil. 1 to 2 per cent, copper free	\$31.50 to 32.00
Silvery, sil. 8 per cent.	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—On the whole this market is quiet, sales being of carlot proportions only. Spot cars of spiegeleisen can be had at \$33, base Hazard, Pa., giving strength to the belief of some purchasers that a lower price might be had on a sizable order. Ferromanganese is dull.

Prices delivered Chicago: 80 per cent ferromanganese, \$97.56; 50 per cent ferrosilicon, \$85 to \$87.50; spiegeleisen, 18 to 22 per cent, \$40.76 to \$41.76.

Plates.—An oil refiner in the Southwest has entered an order for 4500 tons of tank plates, and fresh inquiry from another source in the same territory is for 3800 tons, making a total of not less than 6000 tons of oil tankage business now before the trade. The railroad equipment market is dull. Specifications from the car

builders this week are small. With car inquiry absent from the market except in small lots it is feared that car shops face a sharp curtailment in operations at an early date. Even if large car inquiries came into the market now, it would be a matter of at least two months before orders for steel could be entered at the mills. Mill prices on plates in this district range from 1.90c. to 2c., Chicago. Competition among fabricators has resulted in the naming of lower prices on lots that range from about 400 tons upward. Eastern mills have not hesitated to name 1.90c., Chicago, on business outside of the Chicago switching district. In Chicago and to the west 2c. is still holding on miscellaneous orders to the manufacturing trade.

Mill prices on plates per lb.: 1.90c. to 2c., base, Chicago.

Structural Material.—Plans have been completed for a new power plant for the State Line Generating Co. at Hammond, Ind. The first unit will require close to 10,000 tons of steel, and the total tonnage needed will be not far from 16,000 tons. A public safety building at Milwaukee will take 1200 tons, and bridges for the Great Northern call for 2300 tons. In view of current structural awards of small individual tonnage, the outlook for small shops is more promising. Prices obtained for fabricated steel are still low, and with fabricators engaged at not over 60 per cent of capacity, there appears to be little chance for a wider range between prices obtained and the cost of material. Stocks at shops are low, and, as a consequence, warehouses are experiencing an upturn in business because the buyer of plain material, like purchasers in many other lines, wants prompt delivery and mill operations are so low that the average small order cannot so readily be matched with rolling schedules as was the case when steel output was on a 75 to 80 per cent basis. The price situation shows little change, ruling mill quotations being 1.90c. to 2c., Chicago. The lower quotation is more common in competitive and outlying territory, whereas 2c. represents the going price on small and mixed lots to the general trade.

Mill prices on plain material per lb.: 1.90c. to 2c., base Chicago.

Hot-Rolled Strip.—Specifications are liberal, and production in this district is close to 80 per cent of capacity. Prices are steady at 2.40c. to 2.60c. in the narrow widths and 2.20c. to 2.50c. for strips 6 in. wide and wider.

Cold-Rolled Strip.—Specifications are in smaller volume, and production averages about 70 per cent of capacity. Users ordered out more than their immediate requirements at the end of the second quarter, when the threat of a price advance was before them. The bulk of that tonnage has been carried in stock and used to supply needs during the first month or two of the third quarter. This week several third quarter contracts have been entered at mills, indicating the stocks in the hands of some buyers have again been reduced close to the point of danger. Mill prices on cold-rolled strip are steady at 3.25c., Cleveland, to which must be added a 30c. freight rate for delivery to Chicago.

Wire Products.—Orders from the jobbing trade are in slightly larger volume, due in some measure to the opening of fall trade in the Southern States. Locally and in the Middle West generally, with the possible exception of Iowa, jobbers appear to have satisfied their immediate requirements and are marking time until the fall buying movement makes itself felt. Weather in the past two weeks has been too cool for the proper development of the corn crop, but the small grains have fared well. Optimism prevails in most farm communities, because where a crop shortage prevails prices seem to be making up the difference. Specifications from the manufacturing trade are lighter, but there has been more activity in buying, as some users now see their way clear to contracting for the remainder of the third quarter. Fourth quarter books have not been opened, but producers are now considering making that move not later than Sept. 1. Mill stocks are of moderate size, and production averages about 55 per cent of capacity.

Rails and Track Supplies.—The Chesapeake & Ohio has postponed the purchase of 55,000 tons of standard-section rails and the necessary accessories for at least three weeks. Several Western railroads are preparing

budgets for 1928, and at least one road has indicated that its rail requirements for next year will be as large as in 1927. Rail mill operations in this district have tapered to 30 per cent of capacity. Miscellaneous orders for track fastenings total 2000 tons. Light rails are in small demand.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, \$43; light rails, rolled from billets, \$36 to \$38. *Per Lb.:* Standard railroad spikes, 2.90c.; track bolts with square nuts, 3.90c.; steel tie plates, 2.35c.; angle bars, 2.75c.

Bars.—Schedules for bar shipments now being prepared by automobile builders indicate that September deliveries will be equal to those of August. Specifications from drop forgers are liberal and indicate that that industry is operating at about 80 per cent of capacity. Agricultural machinery manufacturers are busy. Based on steel requirements, tractor plants are running at 100 per cent of capacity, makers of combines and threshers at 70 per cent, while tillage machinery plants are in low production. Soft steel bar prices are steady at 2c. in Chicago, but Eastern competition is severe and prices lack strength in outlying districts. Demand for iron bars is dull, and the uses of this commodity are slowly narrowing. Specifications for rail steel bars are a trifle ahead of shipments, which are below production. Mills continue to add to their stocks of fence post materials. Orders for hard steel bars are practically all of small size, and only an occasional user is obligated by a contract. Mill prices are steady at 1.90c., Chicago.

Mill prices per lb.: Soft steel bars, 2c., base, Chicago; common bar iron, 2c., base, Chicago; rail steel bars, 1.90c., base, Chicago.

Sheets.—Mill operations are holding to 70 per cent of capacity, and current specifications are a trifle larger than shipments. Orders for roofing sheets from the South and West are larger. The general manufacturing trade, including light fabricators, is moderately active. Deliveries on all grades of sheets range from two to three weeks.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 3.15c.; No. 24 galvanized, 4c.; No. 10 blue annealed, 2.40c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Bolts, Nuts and Rivets.—This market is quiet both in terms of specifications and spot sales. Producers now plan to open books for fourth quarter contracts a short time after Labor Day.

Reinforcing Bars.—Awards are in good number, and it is particularly noticeable that many heavy tonnage projects that have been long pending are now going ahead. The determination of dealers to get better prices may have some bearing on the release of work on which lower quotations are outstanding. The bulk of going tonnage in billet bars is being placed at 2c. to 2.10c., local warehouse, but the new quotations range from 2.30c. to 2.75c., the lower figure being applicable on single orders of 500 tons or more. It is reported that the C. A. P. Turner Co. will furnish 1000 tons of steel for bridge footings at Quincy, Ill. Shop engagement in this district is close to capacity. New inquiries and fresh awards are shown on page 516.

Cast Iron Pipe—Chicago has placed 570 tons of 8-in.

pipe with the United States Cast Iron Pipe & Foundry Co. at \$28, Birmingham, or \$36.20 delivered. This price represents a \$2 a ton reduction below quotations of a week ago. The United States company has booked 300 tons of 4, 6 and 8-in. pipe for Washburn, Ill. Royal Oak, Mich., will take bids on 200 tons of 6-in. and 170 tons of 8-in. Class B Pipe, and Springfield, Ohio, will buy a small tonnage of large diameter pipe on Sept. 1.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, \$36.20 to \$39.20; 4-in., \$40.20 to \$43.20; Class A and gas pipe, \$4 extra.

Coke.—All ovens in the Chicago district are lighted, and shipments of by-product foundry coke are holding at the advanced rate attained earlier in the month. Contract prices are firm at \$9.75, local ovens, and \$10.25, delivered in the Chicago switching district.

Old Material.—A steel mill has bought about 5000 tons of heavy melting steel at \$12.50 per gross ton, delivered, or 50c. below the market of a week ago. On the whole, this market is spotty. Users of specialties are maintaining moderate stocks and are buying small lots from time to time at prices that are relatively steady. The grades that are usually taken in heavy tonnages are weak, because dealers are rushing buyers in an effort to find an outlet for incoming tonnage, which they do not want to put on the ground and which in most cases had been purchased at higher prices than can now be realized in the open market.

Prices delivered consumers' yards, Chicago:

Per Gross Ton

Basic Open-Hearth Grades:

Heavy melting steel.....	\$12.00 to \$12.50
Shoveling steel	12.00 to 12.50
Frogs, switches and guards, cut apart, and miscellaneous rails.....	14.00 to 14.50
Hydraulic compressed sheets.....	10.75 to 11.25
Drop forge flashings.....	9.25 to 9.75
Forged, cast and rolled steel car wheels	15.50 to 16.00
Railroad tires, charging box size.....	15.50 to 16.00
Railroad leaf springs, cut apart.....	15.50 to 16.00

Acid Open-Hearth Grades:

Steel couplers and knuckles.....	14.25 to 14.75
Coil springs	15.50 to 16.00
Low phosphorus punchings.....	14.25 to 14.75

Electric Furnace Grades:

Axle turnings	12.50 to 13.00
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Blast Furnace Grades:

Axle turnings	10.50 to 11.00
Cast iron borings.....	10.50 to 11.00
Short shoveling turnings.....	10.50 to 11.00
Machine shop turnings.....	7.50 to 8.00

Rolling Mill Grades:

Iron rails	13.50 to 14.00
Rerolling rails	15.25 to 15.75

Cupola Grades:

Steel rails less than 3 ft.....	15.50 to 16.00
Angle bars, steel.....	14.00 to 14.50
Cast iron carwheels.....	14.50 to 15.00

Malleable Grades:

Railroad	14.50 to 15.00
Agricultural	13.50 to 14.00

Miscellaneous:

*Relaying rails, 56 to 60 lb.....	23.00 to 25.00
*Relaying rails, 65 lb. and heavier.....	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:

Iron angle and splice bars.....	14.00 to 14.50
Iron arch bars and transoms.....	19.00 to 19.50
Iron car axles.....	21.00 to 21.50
Steel car axles.....	18.00 to 18.50
No. 1 railroad wrought.....	11.50 to 12.00
No. 2 railroad wrought.....	10.75 to 11.25
No. 1 busheling.....	9.75 to 10.25
No. 2 busheling.....	5.75 to 6.25
Locomotive tires, smooth.....	13.75 to 14.25
Pipes and flues.....	8.00 to 8.50

Cupola Grades:

No. 1 machinery cast.....	14.75 to 15.25
No. 1 railroad cast.....	13.75 to 14.25
No. 1 agricultural cast.....	13.25 to 13.75
Stove plate	13.00 to 13.50
Grate bars	11.75 to 12.25
Brake shoes	10.50 to 11.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforcing bars, billet steel.....	2.05c. to 2.15c.
Cold-finished steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24).....	3.95c.
Galvanized sheets (No. 24).....	4.80c.
Blue annealed sheets (No. 10).....	3.50c.
Spikes, standard railroad.....	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws.....	60
Hot-pressed nuts, squares, tapped or blank.....	60
Hot-pressed nuts, hexagons, tapped or blank.....	60
No. 8 black annealed wire, per 100 lb.....	\$3.20
Common wire nails, base per keg.....	\$2.85 to 2.95
Cement coated nails, base per keg.....	2.95

The "Achema" almanac for 1926 and 1927, which was published in preparation for the exhibition of chemical apparatus held at Essen, Germany, in June, is replete with articles on the latest scientific developments in chemistry, as well as on new chemical equipment. The headquarters of the Achema (Ausstellung für chemisches Apparatewesen) are at Seelze bei Hannover, Germany.

New York

Moderate Gain in Steel Orders—10,000-Ton Inquiry for Gas Pipe

NEW YORK, Aug. 23.—Pig iron buying is on a diminishing scale, and sales by local brokers during the week totaled less than 7000 tons. Inquiries are also in smaller volume, the largest still pending calling for 1000 tons of foundry iron for New Jersey delivery. Prices have grown no weaker but, in the absence of real tests, cannot yet be described as stronger. The General Electric Co. has closed with Buffalo furnaces against its inquiries for 700 tons for Bayway, N. J., and 1000 tons for Schenectady, N. Y. The Richmond Radiator Co. has bought 500 tons of foundry for barge shipment to its Norwich, Conn., plant. The American Hardware Corporation, New Britain, Conn., has placed 900 tons of No. 1X. With the exception of small lots of Dutch and Indian iron, virtually no foreign foundry is being sold in this district. Fair tonnages of English hematite, however, are being marketed in competition with domestic low phosphorus. Recent sales include lots ranging from 100 tons to 250 tons. English hematite is quoted at \$23.75 to \$24, duty paid, port of entry. The active furnace at Port Henry, N. Y., was shut down Aug. 16.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail).....	\$20.91 to \$21.41
No. 2 plain fdy. (by barge, del'd alongside in lighterage limits N. Y. and Brooklyn).....	18.00 to 19.00
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.89 to 22.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.39 to 22.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.89 to 23.02

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

Reinforcing Bars.—The greater part of the 1000 tons of reinforcing steel required for the Mergenthaler Linotype Co. building in Brooklyn is reported to have been purchased from an eastern Pennsylvania mill. The Truscon Steel Co. will furnish 600 tons of bars for the New York Central station at Buffalo. Other awards during the last week have been small, and no important inquiries have come out. Prices are unchanged as follows:

Prices per lb. on billet steel reinforcing bars: From mill, 1.90c., Pittsburgh. Out of New York warehouse, 3.05c. to 3.15c., delivered at job. Out of Youngstown warehouse, 2.40c., Youngstown, or 2.77½c., delivered New York.

Ferroalloys.—Sales of both ferromanganese and spiegeleisen are confined to carload and small lots. There is more activity in spiegeleisen, the aggregate sales in the past week having amounted to several hundred tons. Prices are unchanged for both alloys and specifications on contract for all ferroalloys are only moderate.

Finished Steel.—Buying of steel has gained no momentum in the last week, and while indications are that the total tonnage for August in this district may run 10 or 15 per cent ahead of July, the improvement is not so important when expressed in tonnage because of the low rate of buying in most lines last month. Structural steel bookings have kept up at a pace which may put August in first place as compared with any month this year according to one large producer. Prices for fabricated material continue low, but the mills are showing resistance to further concessions, and quotations on plain material have held at recent levels. Business in plates and bars is light, but perhaps is slightly better than a few weeks ago, with prices unchanged. Some improvement has developed in the demand for sheets and strip steel, with no instances of price shading. Mills have refused tonnage offered to them at \$1 under prevailing quotations. Prices on wire products are apparently firm, but orders are not numerous. Alloy steels are unchanged both as to price and demand. Mills are operating at a low rate and buyers and sellers alike are watching for signs of increasing activity in the automobile industry.

...rs s. . . an unwillingness to extend Detroit schedules into other markets.

Mill prices per lb. delivered New York: Soft steel bars, 2.14c.; plates, 2.09c. to 2.14c.; structural shapes, 1.90c. to 2.04c.; bar iron, 2.14c.

Warehouse Business.—Most jobbers report a moderate volume of orders, satisfactory considering the season. Prices are unchanged. Galvanized sheets are fairly active, and quotations are firm except when particularly desirable business is involved. There is a small demand for black sheets, and plates are moving in small lots. Purchasing of structural material from stock is spotty, with occasional orders of size to offset the general run of small lots.

Cast Iron Pipe.—The market continues to show evidence of weakness as makers compete keenly for tonnage. At present there is some sizable business under

Warehouse Prices, f.o.b. New York

Base per Lb.	
Plates and structural shapes.....	3.34c.
Soft steel bars and small shapes.....	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal.....	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons.....	4.00c.
Flats and squares.....	4.50c.
Cold-rolled strip, soft and quarter hard,	5.75c. to 6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage).....	3.89c.
Long terne sheets (No. 24 gage).....	5.80c.
Standard tool steel.....	12.00c.
Wire, black annealed.....	4.50c.
Wire, galvanized annealed.....	5.15c.
Tire steel 1½ x ½ in. and larger.....	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases.....	4.50c. to 7.00c.
Machine bolts, cut thread: Per Cent Off List	
¾ x 6 in. and smaller.....	55 to 60
1 x 30 in. and smaller.....	50 to 50 and 10
Carriage bolts, cut thread:	
¾ x 6 in. and smaller.....	55 to 60
¾ x 20 in. and smaller.....	50 to 50 and 10
Coach screws:	
¾ x 6 in. and smaller.....	55 to 60
1 x 16 in. and smaller.....	50 to 50 and 10
Boiler Tubes— Per 100 Ft.	
Lap welded steel, 2-in.....	\$17.33
Seamless steel, 2-in.....	20.24
Charcoal iron, 2-in.....	25.00
Charcoal iron, 4-in.....	67.00
Discounts on Welded Pipe	
Standard Steel—	Black Galv.
½-in. butt.....	46 29
¾-in. butt.....	51 37
1-in. butt.....	53 39
2½-6-in. lap.....	48 35
7 and 8-in. lap.....	44 17
11 and 12-in. lap.....	37 12
Wrought Iron—	
½-in. butt.....	4 +19
¾-in. butt.....	11 +9
1-1½-in. butt.....	14 +6
2-in. lap.....	5 +14
3-6-in. lap.....	11 +6
7-12-in. lap.....	3 +16
Tin Plate (14 x 20 in.)	
	Prime Seconds
Coke, 100 lb. base box.....	\$6.45 \$6.20
Charcoal, per box—	A AAA
IC	\$9.70 \$12.10
IX	12.00 14.25
IXX	13.90 16.00
Terne Plate (14 x 20 in.)	
IC—20-lb. coating.....	\$10.00 to \$11.00
IC—30-lb. coating.....	12.00 to 13.00
IC—40-lb. coating.....	13.75 to 14.25
Sheets, Box Annealed—Black, C. R. One Pass	
	Per Lb.
Nos. 18 to 20.....	4.00c.
No. 22	4.15c.
No. 24	4.20c.
No. 26	4.30c.
No. 28*	4.45c.
No. 30	4.70c.
Sheets, Galvanized	
	Per Lb.
No. 14	4.35c. to 4.60c.
No. 16	4.45c. to 4.70c.
No. 18	4.60c.
No. 20	4.75c.
No. 22	4.80c.
No. 24	4.95c.
No. 26	5.20c.
No. 28*	5.45c.
No. 30	5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

consideration. Hagerstown, Md., opened bids yesterday on about 6000 tons of 24-in. and some 30-in. water pipe, and the Consolidated Gas Co., New York, is in the market for about 10,000 tons of gas pipe. This latter inquiry is about the first of the gas pipe business expected to develop in the fall. The 1600 tons of 24-in. and smaller water pipe on which Baltimore opened bids last week is understood to have gone to R. D. Wood & Co. At the recent opening of bids by Hartford, Conn., for installation of about 3 miles of 30 and 36-in. pipe, the General Contracting Co., Bath Me., was low. While there are continued reports of unusually low prices having been quoted in certain cases, less than \$30 per ton, base Birmingham, is hardly representative of the market and Northern producers of pipe are seldom inclined to go even to this level.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, \$39.25 to \$40.25; 4-in. and 5-in., \$44.25 to \$45.25; 3-in., \$54.25 to \$55.25; Class A and gas pipe, \$4 to \$5 extra.

Coke.—The recent slight improvement in demand for foundry coke continues, but prices are unchanged. Standard foundry is still quoted at \$4 to \$4.25 per net ton, Connellsville, and standard furnace is about \$3.25, Connellsville, on prompt shipment business. Delivered prices on Connellsville foundry coke are: To northern New Jersey, \$8.03 to \$8.28; to New York or Brooklyn, \$8.79 to \$9.04; to Newark or Jersey City, N. J., \$7.91 to \$8.16. Prices on by-product foundry coke are unchanged at \$9.59 to \$10.77 per net ton, delivered Newark or Jersey City.

Old Material.—With the exception of some purchasing at slightly higher prices, the market is substantially unchanged. There is apparently no surplus of material being offered, and in a few instances, as in the case of machine shop turnings, brokers with contracts have been offering to pay as much as they are receiving to secure sufficient tonnage. Turnings are being purchased at \$11 per ton, delivered to consumers at Phoenixville and Harrisburg, Pa. No. 1 heavy melting steel is unchanged at \$13.50 to \$14 per ton, delivered eastern Pennsylvania, and yard grade is generally quoted at \$11 per ton, delivered. On shipments of foundry stove plate to a West Mahwah, N. J., user, brokers are offering \$11 per ton, delivered, with \$11.75 per ton offered on deliveries to a Bridgeport, Conn., consumer. Most railroad grades of scrap are inactive and prices are unchanged.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel.....	\$10.00 to \$10.85
Heavy melting steel (yard).....	7.00 to 7.50
No. 1 heavy breakable cast.....	10.75 to 12.50
Stove plate (steel works).....	8.75 to 9.25
Locomotive grate bars.....	8.00 to 8.50
Machine shop turnings.....	7.00 to 7.50
Short shoveling turnings.....	7.00 to 7.50
Cast borings (blast furnace or steel works).....	7.25 to 7.75
Mixed borings and turnings.....	7.00 to 7.50
Steel car axles.....	15.75 to 16.25
Iron car axles (nom.).....	23.00 to 23.50
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	7.75 to 8.25
Forge fire.....	6.50 to 7.00
No. 1 railroad wrought.....	11.50 to 12.00
No. 1 yard wrought, long.....	10.50 to 11.00
Rails for rolling.....	10.25 to 10.75
Cast iron carwheels.....	10.75 to 11.25
Stove plate (foundry).....	9.00 to 9.75
Malleable cast (railroad).....	10.75 to 11.25
Cast borings (chemical).....	11.75 to 12.75

Prices per gross ton, delivered local foundries:

No. 1 machinery cast.....	\$14.00 to \$14.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	12.50 to 13.00
No. 2 cast (radiators, cast boilers, etc.).....	11.50 to 12.00

Warehouse Prices, f.o.b. Cleveland

Base per lb.

Plates and structural shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforcing steel bars.....	2.25c. to 3.00c.
Cold-finished rounds and hexagons.....	3.65c.
Cold-finished flats and squares.....	4.15c.
Hoops and bands.....	3.65c.
Cold-finished strip.....	5.95c.
Black sheets (No. 24).....	3.75c.
Galvanized sheets (No. 24).....	4.65c.
Blue annealed sheets (No. 10).....	3.25c.
No. 9 annealed wire, per 100 lb.....	\$2.90
No. 9 galvanized wire, per 100 lb.....	3.35
Common wire nails, base per keg.....	2.90

*Net base, including boxing and cutting to length.

Cleveland

Steel Demand from Automotive Industry Disappointing

CLEVELAND, Aug. 23.—The demand for steel bars shows some improvement, but plates, structural material and other finished lines are still dull. Very little business is coming from the automotive industry, the improvement in orders from that source that was predicted for this month having failed to materialize. It is still the general belief in the industry that the reason that there has not been a revival from the early summer lull is because buyers are awaiting the bringing out of the new Ford models. That the Ford company has not yet bought much steel for its cars leads to the conclusion that it may be some time before the company gets under way on a large production basis.

Metal-working industries in this territory outside of the automotive field show little, if any, recovery from the early summer lull. In the building field there is little activity in the northern Ohio territory.

Plate orders are for the most part confined to car lots. Manufacturers' wire is in moderate demand in this territory but inactive in Detroit. Prices are generally steady. Steel bars are firm at 1.80c., Pittsburgh or Cleveland. On plates and structural material 1.80c., Pittsburgh, is maintained. These prices apply to both large and small lots.

Pig Iron.—Sales and inquiries declined in the past week, during which Cleveland interests sold 30,000 tons in foundry and malleable grades, as compared with 50,000 tons during the previous week. While one local producer seems inclined to take a firmer stand on prices for outside shipment, the market is still commonly quoted at \$17.50, furnace, and it is not clearly established that lower prices have entirely disappeared for shipments to points where Cleveland producers must overcome a freight disadvantage. With a price of \$17.50, furnace, now rather generally quoted in the Valley district, it seems improbable that Cleveland iron can be put on a higher basis. For local delivery the market is unchanged at \$18.50, furnace. For Michigan delivery the Lake producers are holding to \$18.50, furnace. Some consumers in recent purchases have bought iron to carry them well into the first quarter of next year, feeling that prices are now down to rock bottom and that the fuel situation may result in slight advances during the winter. Shipping orders have improved, and shipments this month will show a fair gain over July, when shipments were sharply curtailed by many foundries.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25.....	\$19.00
Southern fdy., sil. 1.75 to 2.25.....	23.25
Malleable.....	19.00
Ohio silvery, 8 per cent.....	31.50
Basic, Valley furnace.....	17.25
Standard low phos., Valley fur.....	27.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

Iron Ore.—The consumption of Lake Superior ore during July amounted to 4,294,215 tons, a decrease of 236,350 tons from June. The amount consumed in July last year was 4,786,634 tons. The amount on hand at furnaces Aug. 1 was 25,871,595 tons. The total at furnaces and Lake Erie docks on that date was 31,331,092 tons, as compared with 26,691,229 tons on the same date last year. Central district furnaces consumed 2,111,565 tons of ore in July, a decrease of 114,153 tons. Lake front furnaces used 1,956,578 tons, a decrease of 135,072 tons, and Eastern furnaces consumed 83,846 tons, a decrease of 3955 tons. All-rail furnaces used 142,226 tons, a gain of 16,830 tons. There were 158 furnaces that used Lake ore in blast July 31, a decrease of nine stacks for the month.

Bolts, Nuts and Rivets.—While the demand for bolts and nuts is not active, orders this month show some gain over July. However, the demand for rivets continues very slow. Regular quotations are being maintained.

Sheets and Tin Plate.—While the demand from the automotive industry continues slow, sheet orders have increased slightly and inquiry is more plentiful. The

activity is largely in black sheets. Buying is confined to immediate needs, and some consumers still seem doubtful that present prices will be maintained. While one buyer succeeded in securing a \$3 a ton concession during the week on a small lot of black sheets through the waiving of a width differential, regular prices are generally firmly adhered to. Steel barrel manufacturers are complaining that they are getting no more for their product than several months ago, when they were able to buy sheets at considerably lower prices. Some shading to \$5.40, Pittsburgh, on tin plate has developed.

Strip Steel.—There is virtually no new demand for hot-rolled strip steel, and the call for cold-rolled strip continues slow. There is a limited demand for bands in car lots. No concessions from regular prices are reported. There has not yet been much of a test of present prices on hot-rolled strip, and some buyers still feel that prices are too high considering the fact that they were able to buy wide strip a few months ago at as low as 1.85c.

Semi-Finished Steel.—Little new business is coming out, and specifications against existing orders are light. The market is steady at \$34, Cleveland and Youngstown, for sheet bars, and \$33 for billets and slabs.

Reinforcing Bars.—Business is largely confined to small-lot orders, and little work of any size is in prospect. Rail steel bars are unchanged at 1.65c., mill.

Warehouse Business.—The demand is confined to small miscellaneous lots. The volume of business shows little change as compared with the past few weeks.

Old Material.—The market has a weaker tone except on blast furnace grades, which are fairly firm for shipment to some of the outside consuming points. There is no new consumer demand, and talk of better prices for early fall shipment has about disappeared. There is a limited demand from dealers having orders with a Cleveland consumer, and these dealers are paying \$14 to \$14.25 for No. 1 heavy melting steel and \$11 to \$11.25 for blast furnace scrap. For delivery to a Canton, Ohio, mill, dealers are paying \$12.25 for blast furnace grades.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel.....	\$14.00 to \$14.25
No. 2 heavy melting steel.....	13.50 to 13.75
Compressed sheet steel.....	13.25 to 13.50
Light bundled sheet stampings...	11.50 to 12.00
Drop forge flashings.....	12.50 to 13.00
Machine shop turnings.....	9.25 to 9.50
No. 1 railroad wrought.....	11.50 to 12.00
No. 2 railroad wrought.....	13.75 to 14.00
No. 1 busheling.....	11.50 to 11.75
Pipes and flues.....	10.00 to 10.50
Steel axle turnings.....	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops...	16.50 to 17.00
Low phosphorus, billet bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops...	16.00 to 16.50
Low phosphorus plate scrap.....	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings.....	10.75 to 11.00
Mixed borings and short turnings	10.75 to 11.00
No. 2 busheling.....	10.75 to 11.00
Cupola Grades	
No. 1 cast.....	16.50 to 17.00
Railroad grate bars.....	12.00 to 12.50
Stove plate	12.00 to 12.50
Rails under 3 ft.....	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.50 to 16.00
Rails for rolling.....	16.25 to 16.50

French & Hecht, Davenport, Iowa, wheel manufacturers, who have existed as a partnership since their founding 18 years ago, have been incorporated with a capital of \$3,750,000 and, effective Sept. 1, will become French & Hecht, Inc. Col. G. Watson French and J. L. Hecht, the present owners, will continue in ownership and control. There will be 10,000 shares of first preferred stock, 15,000 shares of second preferred and 12,500 shares of common, all with a par value of \$100. Colonel French is president; J. L. Hecht, vice-president; W. F. Heesch, treasurer; and T. B. Carson, assistant treasurer. The firm has its main plant at Davenport with a branch at Springfield, Ohio.

The Youngstown Sheet & Tube Co. has put on two open-hearth furnaces at its Campbell works. This brings the number of active independent furnaces to 31 out of a total of 53.

Philadelphia

Moderate Increase in Ordering of Some Steel Products—Scrap Stronger

PHILADELPHIA, Aug. 23.—Although business is far from satisfactory in most lines, there has been a slight gain in the number and volume of orders in finished steel, except structural shapes, in which there has been a decline as compared with last month. Pig iron business is extremely quiet, but fourth quarter inquiry is a bit more active in the foundry grades. The scrap market continues to show gaining strength, with some price advances of 50c. a ton.

Pig Iron.—A radiator company is inquiring for 6000 tons of foundry iron for fourth quarter, and other inquiries for that period total about 2000 tons additional. Current sales are small, and the aggregate of business in the past week was considerably below that of either of the two preceding weeks. Iron from other Eastern producing districts, notably Buffalo, continues to come almost to the front door of the eastern Pennsylvania furnaces, and even to meet this competition the nearby furnaces are reluctant to go below a base price of \$20, furnace. In some instances it has been necessary to take a furnace price of \$20.25 for No. 2X to meet Buffalo competition.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$20.76 to \$21.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26 to 21.76
East. Pa. No. 1X.....	21.76 to 22.26
Basic (delivered eastern Pa.)....	20.00
Gray forge	20.50 to 21.00
Malleable	21.50 to 22.00
Standard low phos. (f.o.b. New York State furnace).....	25.00
Copper bearing low phos. (f.o.b. furnace)	24.50 to 25.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	26.17
Virginia No. 2X, 2.25 to 2.75 sil.	26.67

Prices, except on low phosphorus, are delivered Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$5.17 from Virginia furnaces.

Ferromanganese.—Offers of \$85, seaboard, for English ferromanganese have been declined by agents of the English makers. The demand is light and very little business is being done.

Plates.—Prices of 1.75c., Pittsburgh, for the larger lots and 1.80c., Pittsburgh, for the small lots are apparently being firmly held by Eastern mills. The tonnage is slightly better than last month, and operations range from 50 to 60 per cent.

Structural Material.—While prices for plain material are no higher, they are firmer in that mills seem to have reached the limits to which they are willing to go. Usual quotations for small lots are 1.75c., Pittsburgh, with the larger lots \$2 or more a ton below that figure.

Bars.—Ordering of merchant bars has gained slightly, but consumers and jobbers continue to buy for immediate requirements only and quick deliveries

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, 1/4-in. and heavier.....	2.80c. to 3.00c.
Plates, 3/8-in.	3.00c. to 3.20c.
Structural shapes	2.65c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands).....	2.70c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1 1/2 x 1 1/2 in.....	3.50c.
Round-edge steel, planished.....	4.30c.
Reinforcing steel bars, square, twisted and deformed.....	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to 3/8-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24).....	4.35c.
Galvanized sheets (No. 24).....	5.20c.
Blue annealed sheets (No. 10)...	3.30c.
Diamond pattern floor plates—	
1/4-in.	5.30c.
3/8-in.	5.50c.
Rails	3.20c.
Swedish iron bars.....	6.60c.

are demanded, promise of quick delivery, rather than price, being a determining factor. Quotations for ordinary lots are uniform at 1.80c., Pittsburgh.

Sheets.—Some of the larger consumers are still getting deliveries on old contracts made at prices lower than today's schedule, which, however, seems to be prevailing on all new business. The real test of the current quotations will come when more of the second quarter contract tonnage runs out. A low rate of consumption in many plants which use sheets has resulted in an extension of these deliveries beyond the time figured upon when the specifications were accepted.

Imports.—Pig iron imports last week were larger, with 2398 tons coming in from India and 200 tons from The Netherlands. Steel imports amounted to 571 tons as follows: 301 tons of structural shapes from Belgium and 24 tons from Germany; 49 tons of skelp from Germany; 106 tons of bars from Belgium and 43 tons from France; 48 tons of billets from Belgium. Algeria shipped in 5600 tons of iron ore.

Old Material.—Wherever demand springs up for any grade of scrap prices tend higher. In the past week \$13.50, delivered, has been paid for tonnages of stove plate and grate bars, \$12 has been paid for cast iron borings, and the market for machine shop turnings and bundled sheets is firmer, with \$11.50 asked and the probability that it will be paid before the week is ended. A leading consumer of heavy melting steel is still offering \$14, delivered, for round lots, but brokers are not inclined to sell at less than \$14.50, although no business has yet been done at this figure. A factor in the increased strength in turnings and bundled sheets is that machine shops and stamping plants are running at a reduced rate and the volume of scrap production has been materially cut down.

Prices per gross ton, delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel.....	\$14.00
Scrap T rails.....	\$13.00 to 13.50
No. 2 heavy melting steel.....	11.50 to 12.00
No. 1 railroad wrought.....	15.50 to 16.00
Bundled sheets (for steel works)	11.00 to 11.50
Machine shop turnings (for steel works)	11.00 to 11.50
Heavy axle turnings (or equivalent)	12.50 to 13.00
Cast borings (for steel works and rolling mill)	11.50 to 12.00
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars.....	13.00 to 13.50
Stove plate (for steel works)....	13.00 to 13.50
No. 1 low phos., heavy, 0.04 per cent and under.....	18.50 to 19.50
Couplers and knuckles.....	16.75
Rolled steel wheels.....	16.00
No. 1 blast furnace scrap.....	10.50
Machine shop turnings (for rolling mill)	11.50 to 12.00
Wrought iron and soft steel pipes and tubes (new specifications)	12.00 to 12.50
Shafting.....	17.50 to 18.00
Steel axles.....	19.00 to 20.00
No. 1 forge fire.....	11.00
Steel rails for rolling.....	16.00 to 16.50
Cast iron carwheels.....	15.50
No. 1 cast.....	16.00 to 16.50
Cast borings (for chemical plant)	15.00 to 15.50

Production and Bookings of Commercial Steel Castings Decline

Production of commercial steel castings in July is reported by the Department of Commerce at 74,941 net tons, the smallest figure in the past two years. The drop from 81,907 tons in June was about 9 per cent. Compared with 87,040 tons in July last year, the decline has been 14 per cent. July production was at 56 per cent of capacity, the first time in more than two years that the figure has fallen below 60 per cent.

New orders at 71,403 tons in July showed a drop of more than 15 per cent from the 84,466 tons of June. The decline from 76,276 tons in July, 1926, was 6 per cent. Except for May, the bookings were the smallest for any month since last November. They represented 54 per cent of capacity, against 64 per cent in June.

Both classes of castings participated in the decline, production of railroad specialties having dropped off 3 per cent, while that of miscellaneous castings lost 11½ per cent. As to new orders, railroad specialties at 29,906 tons were 14 per cent lower than in June, while miscellaneous castings at 41,497 tons were 16½ per cent lower than in June.

EXPORTS HIGHER IN JULY

Iron and Steel Gains Over June, While Imports Decline Sharply.

WASHINGTON, Aug. 23.—Exports of iron and steel in July, aggregating 190,502 gross tons, showed an increase of 6138 tons over June, with a total of 184,364 tons; while July imports, amounting to 61,172 tons, reflected a decline of 7905 tons under the preceding month, with 69,017 tons. Tin plate was the largest item of exportation in July, with 19,845 tons. Exports of galvanized sheets were 15,095 tons, while the outgoing movement of scrap totaled 17,499 tons. Of the imports, shapes represented 12,606 tons and pig iron, 10,377 tons. Of the latter, about 5000 tons came from British India.

Exports were a little short of last year, when July showed 194,717 tons. Imports, also, were below the 82,411 tons of July, 1926. In fact, only two months of the past 32, February and April of this year, have been below July.

Trade Commission to Investigate Price Bases

Methods used in quoting and charging the prices the consuming public must pay for the necessities of life will be the subject of a comprehensive survey by the Federal Trade Commission in the next few months. It was made known today in connection with the publication for the first time of a resolution adopted by the commission and termed the "price bases resolution."

Three definite modes of quoting and charging prices with reference to locality of the purchaser will be studied and reported on by the economics staff of the commission. Three such systems of price fixing are mentioned by the commission as (1) the delivered price method, (2) the factory base method, and (3) the basing point method.

It is pointed out that numerous companies who distribute their products in various States of the union are quoting prices in which no allowance is made for difference in transportation costs in widely separated markets. This is called the delivered price method. Then other distributors employ the policy of quoting uniform prices at the factory, with freight charges added according to the locality of the consumer. This is termed the factory base method. Still others follow the practice of adding to the market prices at a certain basing point the freight charges from that point to the locality of the consumer. This is the basing point method.

It is expected that facts and data of lasting value to business and industry will be the result of the commission's inquiry into the various practices regarding price bases and that through this study of competitive conditions will develop new and constructive measures for obtaining greater efficiency and economy. The report also will form a basis for determining what are the fair practices in this regard.

Standards Yearbook 1927 represents an effort to present an adequate picture of the diversification and ramification of the standardization movement of the 25 years passing since the Bureau of Standards was established. Copies of the book may be obtained from the Superintendent of Documents, Government Printing Office, Washington, at \$1 each. Its contents outlines the activities and accomplishments of both the Bureau of Standards and other agencies of the Federal Government, the States and municipalities and of technical societies and associations, devoting attention to standardization outlines. It gives also the various foreign agencies and several international standardization agencies proceeding along similar lines.

San Francisco

Buying is Restricted and Inquiry is Light —Mill Prices Untested

SAN FRANCISCO, Aug. 20 (*By Air Mail*)—An award of 2000 tons of structural steel for a department store in San Francisco, which was taken by the United States Steel Products Co., a few fresh inquiries for steel pipe—notably one for 500 tons of standard black pipe for the Western Harvester Co., Stockton, Cal.—and an apparent lack of inclination on the part of buyers to test Eastern mill quotations on shapes and plates are leading developments in a week of light buying and unimportant inquiry in all departments of the market.

Practically all of the Eastern mills are now quoting both plates and shapes at 2.40c., c.i.f. Coast ports, but there have been no tests of prices locally, primarily because of the paucity of inquiry. This is especially pronounced in plates, in which little business of importance has developed since the latter part of May.

Pig Iron.—Buying is confined to immediate needs. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	\$25.00 to \$26.00
*Utah foundry, sil. 2.75 to 3.25...	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25...	25.00
**German foundry, sil. 2.75 to 3.25...	24.25

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings of fabricated structural steel during the week total about 2400 tons; fresh inquiries call for about 1400 tons. Of the latter a boxing arena in San Francisco and a women's club in Oakland, Cal., account for 500 tons each. Eastern mills quote plain material at 2.40c., c.i.f. Coast ports.

Plates.—The Birchfield Boiler Co., Tacoma, Wash., has been awarded 937 tons for a municipal pipe line by the city of Tacoma and the Baker Iron Works of Los Angeles has taken 175 tons for a municipal pipe line for Azusa, Cal. No fresh inquiries of importance have been reported. Eastern mills quote plates at 2.40c., c.i.f. Coast ports.

Reinforcing Bars.—While local concrete bar jobbers are busy with a fairly large number of small orders, there has been no inquiry during the week calling for 100 tons or over. In Los Angeles a local company was awarded 120 tons for an apartment building. Bids will be taken Sept. 9 in Seattle, Wash., on 255 tons for the Mount Diablo dam. Local reinforcing bar jobbers quote as follows: 2.75c. to 2.85c., base, per lb. on lots of 200 tons, and 3c. to 3.10c., base, per lb. on less-than-carload lots.

Cast Iron Pipe.—Public lettings and inquiries have fallen off. The United States Cast Iron Pipe & Foundry Co. is low bidder on 143 tons of 4 and 14-in. Class B pipe for the city of Alhambra, Cal. Tenders are in on 781 tons of 8 and 16-in. Class B pipe for the city of Burlingame, Cal., but no announcement has been made in regard to the low bidder. Cast iron pipe, 6-in. and larger, is quotable at \$43 per ton, f.o.b. dock San Francisco.

Steel Pipe.—In Los Angeles the Crane Co. and the Pacific Pipe & Supply Co. are low bidders on 145 tons of ½ to 2-in. black and galvanized pipe required under Specification Adv. No. W-817. Azusa, Cal., has awarded 520 tons of 3 to 10-in. Matheson-joint pipe to the Crane Co. Los Angeles is inquiring for 825

tons of 6-in. welded pipe, and in Stockton, Cal., the Western Harvester Co. is taking bids on 501 tons of ¼ to 3½-in. standard black pipe.

Warehouse Business.—While some local jobbers report that business during the week has shown slight improvement in the number of fresh inquiries, others state that there has been no change either in the number of orders or in the amount of tonnage called for, which is light. Quotations are unchanged.

Coke.—Local buyers are well covered on their current requirements, and comparatively few of them are inclined to anticipate their forward needs. Importers' stocks, in yards and enroute, are adequate to meet all ordinary demands. Quotations on foundry coke are unchanged and are as follows:

English beehive coke, \$16 to \$17 per net ton at incoming dock; English by-product, \$12 to \$13, and German by-product, \$11.50 to \$12.

Youngstown

Pressure for Shipments Regarded As Precursor of Better Sheet Buying

YOUNGSTOWN, Aug. 23.—Leading sheet makers here are encouraged by events of the past week to believe that some time in the next 30 days buying will be on a larger scale than it has been in the past two months. One development is an increasing number of requests for even prompter shipment than was stipulated with the placing of recent orders. The common interpretation is that consumers have been paring their purchases too close to their needs and actually are finding their supplies insufficient to meet many of their requirements. Manufacturers would welcome an increase in the size of orders that would enable them to extend their mill schedules. For several weeks, the number of mills engaged at the start of the week has been considerably greater than on the following Saturday, and it is said that even at today's prices profits are small with mill scheduling so irregular and uncertain.

It is generally expected that before the middle of next month the automobile industry will be a freer buyer of sheets. It is figured that by that time all of the new models to be shown this year will have appeared in the market and buyers of cars will not be so hesitant about making their purchases. The automobile makers are following their usual procedure in not buying steel heavily at this juncture; the common practice is to stock their dealers with the new cars and then await retail sales as a guide to subsequent production.

There is no sign of higher prices for sheets over the remainder of the year. It has been suggested that an advance might be announced on fourth quarter business, primarily for the purpose of building up an order book at current quotations. The idea does not find favor with local manufacturers, who are satisfied that prices can be maintained without any such artifice, the net result of which, in terms of monetary return, would be no greater than from short-range buying at today's prices.

Those who have been looking for an upturn in general steel business by this time have been disappointed. Business generally is quiet, and there has been no occasion to increase production, which as expressed by ingot output is still at about 60 per cent of capacity.

Pipe business is still well below what it was a year ago. Of the 18 welded pipe units in this district, 13 are in operation, but as some are running only one turn daily, production is not over 60 per cent of capacity. The recent order of the Roxana Petroleum Co. for 75 miles of 6-in. and 220 miles of 10-in. line pipe, which was taken by the Youngstown Sheet & Tube Co., will be more helpful to the operation of its Western than its local pipe furnaces.

Business in bars and plates is in moderate volume with local mills, and it is a very small order on which they now are able to get more than 1.80c., base Pittsburgh. Strip steel makers await increased automobile production to stimulate business, but they are adhering firmly to their prices.

Semi-finished steel is slow, and not much activity

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.10c.
Small angles, ½-in. and over.....	3.10c.
Small angles, under ½-in.....	3.60c.
Small channels and tees, ¾-in. to 2¼-in.....	3.70c.
Spring steel, ¼-in. and thicker.....	5.10c.
Black sheets (No. 24).....	3.85c.
Blue annealed sheets (No. 10).....	4.90c.
Galvanized sheets (No. 24).....	5.45c.
Structural rivets, ½-in. and larger.....	5.50c.
Common wire nails, base per keg.....	\$3.45
Cement coated nails, 100-lb. keg.....	3.45

is noted in pig iron or scrap. On foundry iron, producers regard \$17.50, furnace, for No. 2, as an absolute minimum, and they are also asking the same price for basic iron. Dealers want \$16 to \$16.50 for heavy melting steel scrap and appear likely to get these prices with any substantial increase in steel works operations, since the production of scrap is moderate and offerings are light at today's prices.

Toronto

British Pig Iron Prices Reduced — Scrap Recedes \$1 at Toronto

TORONTO, ONT., Aug. 23.—While there have been no new developments in the demand for pig iron in the Canadian market, sales for the week stand up well when compared with those of previous weeks during the past month. The present demand is almost entirely for spot delivery, with no advance buying reported. Melters throughout Ontario and Quebec are carrying only small stocks in their yards, and as the daily melt tends to hold at a high level, iron needs are also fairly large, thus forcing consumers into the market at frequent intervals. With prices at the present low level, blast furnace representatives are not pushing advance sales, but are satisfied to accept the steady flow of small tonnage orders for immediate delivery and to let the future take care of itself. While the Toronto prices for pig iron remain firm at the new level, it is reported that United States competition in the Montreal market has been more pronounced; in fact, some American iron has been sold in that district at \$1 per ton below the prevailing market quotation on Canadian iron. Following the recent reduction in Canadian iron prices, British imported iron has dropped \$2.50 to \$3 per ton in the Montreal market. The Summerlee and Carron grades, however, are sold in lots from 5 tons upward from warehouse, and as there are but limited stocks on hand, they have little bearing on general market conditions there.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75.....	\$23.60
No. 2 foundry, sil. 1.75 to 2.25.....	23.60
Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75.....	26.00
No. 2 foundry, sil. 1.75 to 2.25.....	26.00
Malleable	26.00
Basic	25.00
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Old Material.—The week brought out a general reduction of \$1 per ton on all grades of scrap in the Toronto market. While Montreal prices have not yet been revised, it is believed that quotations there will speedily fall in line with those of Toronto. The reduction in prices did not stimulate business. The present demand for old material is limited to a few special lines, with sales being made chiefly to consumers who have allowed their stocks to run low. No advance buying has been reported during the week, nor are dealers anxious to bring on a demand of this kind. The daily melt is unchanged, with consumption of old material in good volume in both the Toronto and Montreal districts. While the Hamilton, Ont., steel industry is an extensive user of scrap, mills at Sydney, N. S., and Sault Ste. Marie, Ont., procure most of their supplies from the United States. Recent reports are to the effect that imports of scrap into Canada now exceed exports.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel.....	\$9.50	\$9.00
Rails, scrap	10.00	10.00
No. 1 wrought.....	10.00	14.00
Machine shop turnings.....	7.00	7.50
Boiler plate	7.00	8.00
Heavy axle turnings.....	7.50	8.50
Cast borings	7.50	7.50
Steel turnings	7.00	8.00
Wrought pipe	5.00	6.00
Steel axles	14.00	17.00
Axles, wrought iron.....	16.00	19.00
Per Net Ton		
No. 1 machinery cast.....	15.00	18.00
Stove plate	9.00	13.00
Standard carwheels	13.00	16.00
Malleable scrap	13.00	14.00

Birmingham

Reduced Pig Iron Melt Results in Heavier Stocks at Furnaces

BIRMINGHAM, Aug. 23.—No material change has occurred during the past week in the pig iron market. A survey of the operations of the larger buyers of iron still reveals an excess of pig iron production in comparison with melt, though a similar canvass of the jobbing and specialty foundries shows a very much closer relation. Thus far producers have shown no tendency to curtail output, preferring rather to augment their stocks on yards. Under present conditions it is considered doubtful that a further reduction in prices would stimulate buying.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.....	\$17.25
No. 1 foundry, 2.25 to 2.75 sil.....	17.75
Basic	17.25
Charcoal, warm blast.....	29.00

Cast Iron Pipe.—The manufacturers of cast iron pipe in this district continue to operate their plants on practically the same percentage basis as has prevailed for the past several weeks. No further change in prices has developed, quotations being \$30 per net ton, f.o.b. plants, for 6-in. and larger sizes.

Coke.—The producers of foundry coke, which at present is being made solely in by-product operations, have been able to move practically all their current make, having adjusted oven output to meet the foundrymen's needs at the present time. Prices are firm at \$5.50 per net ton, f.o.b. ovens, for established standard brands, and at \$5, ovens, in the case of one producer who recently entered the foundry trade.

Old Material.—The scrap market cannot be considered dull. It is true that prices are comparatively low, but the volume of business transacted in the purchase and sale of scrap is satisfactory in view of present conditions in the pig iron market. Melters are using as high as 30 per cent to 40 per cent of good machinery scrap in high duty castings.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel.....	\$10.50 to \$11.00
Scrap steel rails	12.50 to 13.00
Short shoveling turnings.....	8.50 to 9.00
Cast iron borings.....	8.50 to 9.00
Stove plate	13.00 to 14.00
Steel axles	16.00 to 17.00
Iron axles	16.00 to 17.00
No. 1 railroad wrought.....	11.00 to 12.00
Rails for rolling.....	13.00 to 14.00
No. 1 cast.....	14.00 to 15.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels.....	12.00 to 13.00
Cast iron borings, chemical.....	13.00 to 13.50

Boston

Pig Iron Has Steadier Tone — Scrap Shows Signs of Weakness

BOSTON, Aug. 23.—Pig iron sales have undergone further curtailment during the past week. No sale reported exceeded 300 tons, while most of them were in

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams.....	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes.....	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265 to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	5.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Round and hexagons.....	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

car lots and in the aggregate were not more than 2000 tons. New York State iron sold at an advance of 25c. a ton, but the tonnage involved was small and more or less of special analysis. Not enough iron has been sold to indicate whether the market is actually higher. Most furnaces, however, are maintaining silicon differentials for the first time in many weeks. Based on the current weekly New England melt, a majority of foundries have sufficient iron on hand or on order to carry them well into the fourth quarter. They are taking iron on schedule, and during the past week several requested furnaces to speed up shipments.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25.....	\$20.91 to \$21.41
Buffalo, sil. 2.25 to 2.75.....	21.41 to 21.91
East. Penn., sil. 1.75 to 2.25.....	23.15 to 23.65
East. Penn., sil. 2.25 to 2.75.....	23.65 to 24.15
Virginia, sil. 1.75 to 2.25.....	27.42
Virginia, sil. 2.25 to 2.75.....	27.92
Alabama, sil. 1.75 to 2.25.....	24.16 to 26.02
Alabama, sil. 2.25 to 2.75.....	24.66 to 26.52

Freight rates: \$4.91 from Buffalo, \$3.65 from eastern Pennsylvania, \$5.92 from Virginia, \$6.91 to \$8.77 from Alabama.

Cast Iron Pipe.—Newton, Mass., closed bids today, Aug. 23, on approximately 200 tons of 6-in. pipe. No other open municipal business is reported. Attleboro, Mass., has postponed opening bids on a small tonnage. Private buying of carloads of pipe is unusually active for this time of the year. Indications are that no open bids on round tonnages will be asked within the next two or three weeks. Prices on pipe remain unsettled but are not actually lower. Quotations on domestic pipe are: 6, 8, 10 and 12-in. diameters, \$47.10 a ton, delivered common Boston freight rate points; 16-in. and larger, \$46.10. A differential of \$4 a ton is asked on Class A and gas pipe.

Old Material.—Business in old material has slowed up, because most representatives of New York and Pennsylvania houses have been instructed to buy nothing except subject to confirmation, owing to anticipated price reductions. The outlook for steel mill borings and skeleton appears more uncertain than that for other materials. Small bundled cotton ties were sold here in the past week at \$5.65 a ton, on cars shipping point, a reduction of 20c. Two cars of chemical borings were taken at \$10.60 a ton, on cars, but most transactions are at, or close to, \$10.10. Some yard steel has been bought for \$7.10 a ton, on cars, but dealers have had so many rejections on such material that business is of small proportions. In recent transactions heavy cast brought \$11.75 a ton, on cars, and No. 1 heavy melting steel for Bridgeport, Conn., delivery, \$8.25. Heavy melting steel for delivery outside New England brings a higher price.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$9.50 to \$10.00
Scrap rails.....	8.00 to 8.50
No. 1 railroad wrought.....	10.50 to 11.00
No. 1 yard wrought.....	8.50 to 9.00
Machine shop turnings.....	6.00 to 6.25
Cast iron borings (steel works and rolling mill).....	6.00 to 6.60
Bundled skeleton, long.....	6.00 to 6.50
Forged flashings.....	6.50 to 7.00
Blast furnace borings and turnings.....	6.00 to 6.25
Forged scrap.....	5.50 to 6.10
Shafting.....	13.50 to 14.00
Street car axles.....	16.00 to 16.50
Wrought pipe (1 in. in diameter, over 2 ft. long).....	7.00 to 7.50
Rails for rerolling.....	10.00 to 10.50
Cast iron borings, chemical.....	10.00 to 10.50

Prices per gross ton delivered consumers' yards:

Textile cast.....	\$15.00 to \$15.50
No. 1 machinery cast.....	14.50 to 15.00
No. 2 machinery cast.....	12.50 to 13.00
Stove plate.....	11.00 to 12.00
Railroad malleable.....	14.50 to 15.00

Coke.—Consumption of foundry coke in New England is no larger than a week ago and is somewhat less than a year back. The New England Coal & Coke Co. and the Providence Gas Co., which are selling by-product foundry coke at \$13 a ton, delivered, within a \$3.10 freight rate zone, intimate that prices may be higher next month, owing to a better demand and stronger prices for bituminous coal. Foundry coke made outside New England is selling more freely but is far from active. They usually sell on a delivered basis that is all of \$1.50 a ton under prices on New England fuel.

Imports.—Imports of pig iron at this port during

the first half of August totaled 1583 tons, consisting of 1406 tons of Indian and 177 tons of Dutch iron. During the first half of July, this year, imports totaled 627 tons, and in the first half of August, last year, 2564 tons. Imports of ore during the first half of August were 10,280 tons from Bizerta and 8047 tons from Algeria, a total of 18,327 tons, as against 9082 tons in the first half of July, this year, and 16,075 tons in the first half of August, 1926. Coal imports have been resumed, following a period of inactivity covering many months. In the first half of August 5369 tons of coal from Rotterdam and 3500 tons from Wales were received at Boston.

Pacific Northwest

Stenciling Order Aimed at Foreign Steel—Plates and Shapes Advanced

SEATTLE, Aug. 19 (*By Air Mail*).—Effective Aug. 8, Eastern steel mills made an advance of \$2 per ton on plates, or from 2.30c. per lb. to 2.40c., and on shapes \$1 per ton, from 2.35c. to 2.40c. However, the advance in plates and shapes will not cut much figure for several weeks, or longer, as the mills covered their trade at the old prices for sufficient time to allow it to work off old orders and to take care of bids that had gone in based on the old prices. There is considerable tonnage in plates and shapes in stock here, which it will take some time to work off.

Local sales managers of Eastern steel makers, and also jobbers, report that business in the first half of August showed some increase over the second half of July, and the trade is encouraged by the fact that a great amount of new work is in sight that may come out in the next two or three months. Both the State of Washington and the city of Seattle have large programs laid out for new work and improvements, which will take considerable steel. While there is some doubt in consumers' minds as to the advisability of the advance in local steel prices in the face of strong foreign competition, it is understood that the new quotations are applying on all orders for work that was not previously covered.

Pig Iron.—New buying is very light, being confined to small lots for early delivery. Prices are unchanged. Utah No. 2 foundry and basic range from \$24 to \$25 per gross ton, delivered Seattle.

Plates.—A contract for 800 tons of plates for new water lines at Tacoma, Wash., was placed with Bethlehem Steel Corporation, but no other orders of moment have been placed and little new work is in sight. Eastern mills are now quoting 2.40c., c.i.f. Seattle, on tank plates ¼ in. and heavier.

Structural Shapes.—An ordinance recently passed by the Seattle City Council requires that on all plates and structural shapes the name of the maker must be stenciled on each piece before it can be accepted. This was done to prevent the sale of foreign steel under the pretence of being American made. It is said that this has been done in the past. Bids were opened on Aug. 10 for about 1500 tons of shapes for a pulp mill of the Rainier Pulp & Paper Co. at Astoria, Ore., but it is not believed the contract will be placed for some little time, as certain financial arrangements must be made before the work can proceed. Bids will be asked the first week in September for the Seattle Auditorium, about 1200 tons. No decision has been reached as to whether the 18-story office building of the Northern Life Insurance

Warehouse Prices, f.o.b. Seattle

	Base per lb.
Plates and structural shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforcing bars.....	2.75c.
Angles, bar sizes.....	3.00c.
Angles, structural.....	3.00c.
Black sheets (No. 24).....	4.75c.
Galvanized sheets (No. 24).....	5.50c.
Blue annealed sheets (No. 10).....	4.00c.
Wire nails, base per keg.....	\$3.75
Cement coated nails, 100-lb. keg.....	3.75

Co., Seattle, will be of structural steel or reinforced concrete construction, but chances favor the latter. Builders of the Exeter apartment building, another local project, have decided on concrete. Bids went in Aug. 12 for the building of a grain elevator by the port of Kelso, Wash., calling for about 1200 tons of structural steel and a larger tonnage of reinforcing steel. Eastern mills quote plain material at 2.40c. per lb., c.i.f. Seattle.

Steel Bars.—The Pacific Coast Steel Co. has taken about 400 tons of reinforcing bars for the new Exeter apartment, Seattle, and 300 tons of reinforcing steel for State and municipal work. The Northwest Steel Rolling Mills have taken 100 tons for a local apartment and about 200 tons for city and State work. Competition between local and foreign reinforcing steel is very keen, it being reported that Belgian reinforcing steel bars have recently been sold as low as 1.60c., c.i.f. Portland. Mill prices on mild steel bars have not been advanced, remaining at 2.35c. per lb., delivered Seattle, while reinforcing bars are quoted at 1.90c. to 2.10c., delivered Seattle.

Shafting.—Some betterment in demand is reported. Mills quote cold-rolled shafting at about 3c. per lb., c.i.f. Seattle.

Sheets.—As yet the expected advance in sheet prices has not been made, and it may not come for some little time. Jobbers and consumers are understood to be covered for some time at former prices and, in some cases, at lower figures than are now being quoted. Demand is light, and has been for several months. Eastern mill prices are 2.25c. per lb., base Pittsburgh, for No. 10 gage blue annealed, 3c. for No. 24 black and 3.85c. for No. 24 galvanized. Effective Aug. 1, the rail-and-water rate on sheets from Pittsburgh was advanced to 71c. per 100 lb. for Seattle delivery.

Warehouse Business.—Local jobbers report that business in the first half of August was larger than in the last half of July, and believe that the second half of this month will show increase over the first half. No advance in prices has been made by jobbers on account of the higher water rates, as their needs were covered for some time ahead at prices based on the old water rates.

Old Material.—The local market is practically lifeless, and prices are nominal, as not enough material is being sold to establish a market. Nominal prices are as follows: Heavy melting steel scrap, charging box sizes, \$10 to \$10.50 per gross ton; cast iron scrap, \$7 per net ton; miscellaneous scrap, \$9 to \$9.50 per net ton, delivered Seattle.

St. Louis

Pig Iron Sales Total 25,000 Tons — Further Advances in Scrap

ST. LOUIS, Aug. 23.—A buying movement of fair proportions in pig iron has been started in this district. The activity is believed to be based on improved prospects for crops and on a more hopeful outlook for general business this fall and winter. During the past

week sales aggregating close to 25,000 tons were made. Of the tonnage placed, about two-thirds represented a sale of basic iron by the leading local producer to an East Side steel interest. The remainder was foundry iron, in lots ranging from a carload to 1000 tons, and all for delivery through the rest of this year. Virtually all classes of consumers were represented in the sales, with jobbing foundries and specialty makers making a particularly favorable showing. Prices paid were at the levels that have prevailed since the middle of last month.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b.	
Granite City, Ill.	\$19.50 to \$20.00
Northern No. 2 fdy., delivered	
St. Louis	21.66
Southern No. 2 fdy., delivered...	21.67
Northern malleable, delivered....	21.66
Northern basic, delivered.....	21.66

Freight rates: 81c. from Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

Coke.—Somewhat greater interest is being manifested in metallurgical coke. Several sizable sales have been made, the largest reported being 20 cars to an Iowa melter. A feature of the situation is the general desire on the part of melters to augment their stock piles against any untoward development that may arise this fall or winter as a result of the bituminous miners' strike. Some Southern coke has been placed in this district, but the great bulk of the business continues to go to the local and nearby by-product ovens. Prices are firm.

Finished Iron and Steel.—Mid-season conditions prevail in the market for finished iron and steel. The structural situation, however, has been enlivened by expectations of the letting of several sizable jobs and by the favorable building permit record of July. Demand for sheets has continued satisfactory, save for a slight slowing down in the call for galvanized material. Tin plate is active, with canners the chief buyers. Specifications on new orders for tank plates have picked up during the past 10 days, the betterment being due to the general manufacturing trade, as railroad car builders and the oil fields are still taking little material.

Old Material.—Scrap continues strong and fairly active. While consumers are not buying in impressive volume, dealers are bullish and are strenuously bidding for material to apply on outstanding contracts and, in some instances, to lay down in their yards. Steel leads the list in point of strength, with blast furnace material second in order. Dealers are freely offering \$12 for heavy melting and shoveling steel, and are not picking up much at that figure. An exception to the general firmness is cast scrap, which is slightly lower in price and dull. Railroads are shipping promptly and heavily, but their offerings have dropped off sharply as contrasted with recent weeks. The only lists are 100 tons from the New Orleans Great Northern, and 15 and 10 cars respectively from the St. Louis-San Francisco and the Missouri Pacific.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel.....	\$11.50 to \$12.00
No. 1 locomotive tires.....	14.25 to 14.75
Heavy shoveling steel.....	11.50 to 12.00
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart.....	14.50 to 15.00
Railroad springs	15.25 to 15.75
Bundled sheets	8.50 to 9.00
No. 2 railroad wrought.....	11.50 to 12.00
No. 1 busheling.....	10.25 to 10.75
Cast iron borings.....	9.25 to 9.75
Iron rails	12.50 to 13.00
Rails for rolling.....	14.75 to 15.25
Machine shop turnings.....	6.75 to 7.25
Steel car axles.....	19.00 to 19.50
Iron car axles.....	22.50 to 23.00
Wrought iron bars and transoms.....	18.75 to 19.25
No. 1 railroad wrought.....	11.00 to 11.50
Steel rails, less than 3 ft.....	15.50 to 16.00
Steel angle bars.....	12.75 to 13.25
Cast iron carwheels.....	13.50 to 14.00
No. 1 machinery cast.....	15.00 to 15.50
Railroad malleable	13.25 to 13.75
No. 1 railroad cast.....	14.50 to 15.00
Agricultural malleable	12.50 to 13.00
Relaying rails, 60 lb. and under...	20.50 to 23.50
Relaying rails, 70 lb. and over...	26.50 to 29.00

Warehouse Prices, f.o.b. St. Louis

	Base per lb.
Plates and structural shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24).....	4.80c.
Galvanized sheets (No. 24).....	5.35c.
Blue annealed sheets (No. 10).....	3.60c.
Black corrugated sheets.....	4.65c.
Galvanized corrugated sheets.....	5.30c.
Structural rivets	3.60c.
Boiler rivets	3.80c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller.....	70
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped..	60
Hot-pressed nuts, hexagons, blank or tapped	60

Cincinnati

Steel Specifications Gain—Concessions on Roofing Sheets

CINCINNATI, Aug. 23.—The pig iron market is quiet, the flurry of buying early last week having subsided. Some buying of small lots for immediate needs is noted. Prices are unchanged for both Northern and Southern iron. The only price feature is an apparent attempt by Lake furnaces to lift their base to \$17.50. One local seller reports inquiries for 500 tons and sales of around 3000 tons in five lots, of which the largest was 1000 tons. Scattering inquiries and sales cover several hundred tons of spiegeleisen and ferromanganese. An inquiry from Chicago calls for 800 tons of fluorspar. A Parkersburg, W. Va., manufacturer is inquiring for 1000 tons of Northern iron for his Pomeroy, Ohio, plant. The Belfont stack at Ironton, Ohio, goes into blast at the end of the week.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25....	\$20.39 to \$20.89
So. Ohio malleable.....	20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25....	20.94
Alabama fdy., sil. 2.25 to 2.75....	21.44
Tennessee fdy., sil. 1.75 to 2.25..	21.69
Southern Ohio silvery, 8 per cent	30.39

Freight rates: \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

Finished Material.—Specifications and orders in the past week were from widely diversified sources and reflected a slight expansion in the operations of a number of consuming industries. Buyers, however, are reluctant to purchase for future needs and are contracting only for enough material to fill their requirements during the remainder of the third quarter. Fabricators in this territory are fairly well engaged but must have additional work soon in order to maintain production on the present basis. The small shops have suffered the most from lack of business. Gas-holder builders state that business continues to develop at a satisfactory rate. Sheet metal manufacturers have had large sales this year, and their trade has held up well during the summer months. Mill prices are stable on all products except galvanized sheets for roofing purposes in the southeastern Atlantic States, where competition has brought out concessions of \$1 to \$2 a ton. Blue annealed and black sheets are well established at 2.25c. and 3c., base Pittsburgh, respectively. Output of sheet mills in this territory has continued at about 85 per cent of capacity. Bars, plates and shapes are unchanged at 1.80c., base Pittsburgh, and a moderate volume of tonnage has been booked in the past two weeks. The wire goods market is a little stronger, although sales are still at a low point. Common wire nails are quoted at \$2.69 a keg, delivered at Cincinnati.

Coke.—The market shows signs of improvement, with an advance in domestic coke in sight next week and with the possibility of a higher price for foundry coke should coal prices continue to rise.

Foundry coke prices per net ton, delivered Cincinnati: By-products coke, \$9.52 to \$9.64; Wise County coke, \$7.59 to \$8.09; New River coke, \$10.09 to \$10.59. Freight rates: \$2.14 from Ashland, Ky.; \$2.59 from Wise County and New River ovens.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes.....	3.40c.
Bars, soft steel or iron.....	3.30c.
Reinforcing bars.....	3.30c.
Hoops.....	4.00c. to 4.25c.
Bands.....	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares.....	4.35c.
Open-hearth spring steel.....	4.75c. to 5.00c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue annealed sheets (No. 10)...	3.60c.
Structural rivets.....	3.85c.
Small rivets.....	65 per cent off list
No. 9 annealed wire, per 100 lb.....	\$3.00
Common wire nails, base per keg.....	2.95
Cement coated nails, base 100 lb. keg...	2.95
Chain, per 100 lb.....	7.55
Net per 100 Ft.	
Lap-welded steel boiler tubes, 2-in.....	\$18.00
4-in.....	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.....	39.00

Warehouse Business.—Sales have been about 15 per cent heavier than in July. Bars, structural shapes and plates continue to move well, and the demand for pipe and tubing shows improvement. Cold-rolled bars also are more active, but orders for sheets are light. Prices are firm and unchanged.

Old Material.—Mills are not buying any considerable tonnage except at concessions, and dealers are not selling in any great quantities at current prices. On recent railroad offerings some Cincinnati houses paid much higher than July prices, and Louisville dealers took most of the Southern Railway list at \$2 a ton above local bids. Heavy steel scrap is stronger as a result of increased demand. The American Rolling Mill Co. is reported to have equally divided a scrap contract for its Ashland, Ky., plant between two local dealers.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$12.50 to \$13.00
Scrap rails for melting.....	13.25 to 13.75
Loose sheet clippings.....	9.00 to 9.50
Champion bundled sheets.....	9.50 to 10.00
Cast iron borings.....	9.00 to 9.50
Machine shop turnings.....	8.00 to 8.50
No. 1 busheling.....	10.50 to 11.00
No. 2 busheling.....	7.50 to 8.00
Rails for rolling.....	14.00 to 14.50
No. 1 locomotive tires.....	14.25 to 14.75
No. 1 railroad wrought.....	12.00 to 12.50
Short rails.....	17.75 to 18.25
Cast iron carwheels.....	13.50 to 14.00
No. 1 machinery cast.....	17.50 to 18.50
No. 1 railroad cast.....	14.50 to 15.00
Burnt cast.....	8.50 to 9.00
Stove plate.....	10.50 to 11.00
Brake shoes.....	10.25 to 11.00
Railroad malleable.....	13.00 to 13.50
Agricultural malleable.....	12.50 to 13.00

Buffalo

Pig Iron Buying Subsides—Open-Hearth Operations Improve

BUFFALO, Aug. 23.—The wave of pig iron buying has apparently passed for the time being, and little new business is being offered. Furnaces appear to be taking a stronger stand on a \$16.50 base, inasmuch as some sizable lots which were offered failed to break that price. Among other inquiries, one calling for 500 tons of foundry came out for last quarter delivery and, although a strong effort was made to place it at \$16, late reports indicated that the business had not yet been closed. Basic has been pegged at \$16.50, and one malleable maker is declining to quote below \$17, furnace. This last maker is quoting a minimum of \$16.50 on No. 2 plain, \$17 on No. 2X and \$17.50 for No. 1X. It is asking a \$1 differential for each increase of 50 points in silicon.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25..	\$16.00 to \$16.50
No. 2X foundry, sil. 2.25 to 2.75..	16.50 to 17.00
No. 1X foundry, sil. 2.75 to 3.25..	17.50
Malleable, sil. up to 2.25.....	16.50 to 17.00
Basic.....	16.50
Lake Superior charcoal.....	27.25

Finished Iron and Steel.—Bars are a little weaker and are reported as being sold at 2.015c., Buffalo, to the preferred trade. Sheets are moving in fairly good volume, with prices firmer than they have been in many weeks. There are no reports of lower than 3c., base Pittsburgh, for black; 3.85c. for galvanized or 4.25c. for automobile body sheets. Jobbers report a better movement of steel pipe. The Donner Steel Co. has increased its open-hearth operations, which are now at 50 per cent of capacity. Reinforcing bars are moving

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes.....	3.40c.
Soft steel bars.....	3.30c.
Reinforcing bars.....	2.75c.
Cold-finished flats, squares and hexagons.	4.45c.
Rounds.....	3.95c.
Cold rolled strip steel.....	5.85c.
Black sheets (No. 24).....	4.30c.
Galvanized sheets (No. 24).....	5.15c.
Blue annealed sheets (No. 10).....	3.80c.
Common wire nails, base per keg.....	\$3.65
Black wire, base per 100 lb.....	3.90

in good volume. A Buffalo maker has booked 250 tons for the Rochester, N. Y., Masonic temple.

Old Material.—The market is very inactive, though there is a better feeling and dealers look for some purchasing within the next few weeks. Shipments are still being held up by one of the larger mills. A little demand for borings and turnings is the only feature. Dealers are paying \$14.25 to cover their old orders for No. 1 heavy melting steel. Stocks in yards are not heavy.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades		
No. 1 heavy melting steel.....	\$14.75 to	\$15.00
No. 2 heavy melting steel.....	14.00 to	14.25
Scrap rails	14.50 to	15.00
Hydraulic compressed sheets.....	12.75 to	13.25
Hand-bundled sheets	9.00 to	9.50
Drop forge flashings.....	11.50 to	12.00
No. 1 busheling.....	13.00 to	13.25
Heavy steel axle turnings.....	12.75 to	13.25
Machine shop turnings.....	9.50 to	10.00
Acid Open-Hearth Grades		
Railroad knuckles and couplers..	15.75 to	16.25
Railroad coil and leaf springs...	15.00 to	15.75
Rolled steel wheels.....	15.75 to	16.25
Low phosphorus billet and bloom ends	17.00 to	17.50
Electric Furnace Grades		
Heavy steel axle turnings.....	12.75 to	13.25
Short shoveling steel turnings...	10.75 to	11.00
Blast Furnace Grades		
Short shoveling steel turnings...	10.75 to	11.00
Short mixed borings and turnings	10.00 to	10.50
Cast iron borings.....	10.75 to	11.00
No. 2 busheling.....	10.00 to	10.50
Rolling Mill Grades		
Steel car axles.....	15.00 to	16.00
No. 1 railroad wrought.....	13.00 to	13.50
Cupola Grades		
No. 1 machinery cast.....	15.25 to	15.75
Stove plate	13.00 to	13.50
Locomotive grate bars.....	11.00 to	11.50
Steel rails, 3 ft. and under.....	16.50 to	17.00
Cast iron car wheels.....	14.00 to	14.50
Malleable Grades		
Railroad	15.00 to	15.50
Agricultural	15.00 to	15.50
Industrial	15.00 to	15.50

Detroit Scrap Firm—Stove and Furnace Makers Increase Melt

DETROIT, Aug. 23.—The scrap market continues to have a firm tone, although no sales involving a sizable tonnage have been reported during the past week. The stove and furnace manufacturers are showing evidences of increased melt, and the radiator manufacturers in the district are operating at about capacity. Automotive production shops are working on close schedules and are anticipating increases.

Dealers' buying prices per gross ton f.o.b. cars, Detroit:

Heavy melting and shoveling steel	\$12.50 to	\$13.00
Borings and short turnings.....	9.00 to	9.50
Long turnings	8.00 to	8.50
No. 1 machinery cast.....	17.00 to	18.00
Automobile cast	18.50 to	19.50
Hydraulic compressed sheets.....	11.25 to	11.75
Stove plate	11.50 to	12.50
No. 1 busheling	10.50 to	11.00
Sheet clippings	7.75 to	8.25
Flashings	10.50 to	11.00

Approve Merger of Industrial Works and Brown Hoisting Machinery Co.

Merger of the Brown Hoisting Machinery Co., Cleveland, and the Industrial Works, Bay City, Mich., has been approved by the directors of both companies and will soon be submitted to the stockholders of the two companies for ratification. The combined organization will be known as the Industrial-Brown Hoist Corporation, and A. C. Brown of the Cleveland company will be president. The new company, it is stated, will have combined resources of \$13,000,000. Both companies manufacture extensive lines of material handling equipment, including locomotive cranes. E. R. Perry, late president of the Industrial Works was engaged in the merger negotiations before his death early this month.

The eighth annual outing of the Boston Chapter of the American Society for Steel Treating will be held at Riverside Park on Saturday, Sept. 10.

NEW TRADE PUBLICATIONS

Main Roll Drives.—General Electric Co., Schenectady. Bulletin of four pages illustrating and describing direct-current motors for main roll drives of steel mills. These are designed for adjustable-speed service and may be reversing or non-reversing. Illustrations are numerous.

Preheaters.—MacDonald Corporation, East Tioga and Memphis Streets, Philadelphia. Bulletin 707 of four pages featuring the Gradon preheater, made of wrought steel and welded. The heating surface in different sizes varies from 3 to 1084 sq. ft., while weights range from 165 to 7400 lb.

Nickel Alloy Steel Products.—International Nickel Co., 67 Wall Street, New York. Eight-page buyers' guide, giving list of makers of various types of items which are made of nickel alloy steel. This is the second edition and is dated July, 1927.

Electric Motors.—Century Electric Co., 1806 Pine Street, St. Louis. Folders 532, 652 and 653, dealing respectively with the company's type SP split phase induction motors, its repulsion start induction single phase motors, and its double squirrel cage 3- and 2-phase induction motors. All the folders are adequately illustrated and deal at length with the outstanding features of the units.

Variable-Speed Speed Changer.—Stephens Adamson Mfg. Co., Aurora, Ill. Booklet of 24 pages featuring and describing in detail a new speed changer suited for variable speeds. Illustrations are numerous and tabular data show dimensions, powers, etc.

Combination and Gang Dies.—Detroit Stamping Co., Detroit. Folder No. 12, giving inside and outside diameters of combination dies for making flat and concentric washers.

Oil Tempering Baths.—General Electric Co., Schenectady. Bulletin 801 of four pages illustrates and describes self-contained electrically heated baths for tempering carbon steels. Automatic control is a feature.

Oil-Burner Equipment.—Grant Accessories Corporation, 107 Liberty Street, New York. Loose-leaf folder of 18 pages featuring valves, strainers, blowers and pumps of various descriptions for use in connection with oil-burning equipment. Dimensioned drawings are used in each description, together with a halftone.

Steam Engines.—Engberg's Electric & Mechanical Works, St. Joseph, Mich. Catalog of 32 pages devoted to engines from 1 to 200 hp., fitted with throttle governor for either constant or variable speed service. They are designed particularly for use with stokers, fans, refrigerating machines, compressors, generating sets, pumps, conveyors, etc. Illustrations are numerous. Horsepower tables cover five pages.

Seamless Flexible Metal Hose.—Charles Cory & Son, 185 Varick Street, New York. Bulletin of 12 pages illustrating and describing metal hose for use as a flexible conveyor for non-solids and non-abrasives. The leak-proof feature is stressed, as well as ability to stand high pressures and temperatures.

Flood Lighting.—Crouse-Hinds Co., Syracuse, N. Y. Folder No. 44 and Bulletin 2095 deal with efficiency in flood lighting of railroad yards, manufacturing plants and other large areas by means of specially designed projectors.

Troubles in Castings.—Nugent Steel Castings Co., 3100 South Wood Street, Chicago. Bulletin of 12 pages entitled "Trouble Shooter," dealing with the intricate problem of designing castings to avoid undue strains, both due to cooling and in service. Reduction in rejections should follow a satisfactory design.

Punches and Dies.—Whitney Metal Tool Co., Rockford, Ill. Hand book No. 7, 56 pages. Dimensions are given on a wide variety of punches, dies, riveting tools, shear blades and pins, the latter including drift and barrel pins. The catalog is thumb-indexed for convenient reference. Among the useful data included is a chart for use in determining on the machine for various punching jobs.

Locomotive Cranes and Pile Drivers.—Industrial Works, Bay City, Mich. Book No. 123, 42 pages, more than half of which are devoted to steam and electrically operated wrecking cranes. Features of construction are described and illustrated and specifications given. These cranes range in capacity from 75 to 200 tons. The second section of the booklet is devoted to pile drivers, combination crane-pile drivers for railroad operations and heavy construction work, and accessories.

NON-FERROUS METAL MARKETS

The Week's Prices		Aug. 23	Aug. 22	Aug. 20	Aug. 19	Aug. 18	Aug. 17
Cents per Pound for Early Delivery	Lake copper, N. Y.	13.25	13.25	13.25	13.30	13.30	13.37 1/2
	Electrolytic copper, N. Y.* ..	12.87 1/2	12.87 1/2	12.87 1/2	12.87 1/2	12.87 1/2	13.00
	Straits tin, spot, N. Y.	63.75	63.62 1/2	64.25	64.12 1/2	63.75	63.75
	Lead, New York.....	6.65	6.65	6.70	6.70	6.70	6.70
	Lead, St. Louis.....	6.30	6.30	6.35	6.35	6.40	6.40
	Zinc, New York.....	6.67 1/2	6.70	6.72 1/2	6.72 1/2	6.72 1/2	6.72 1/2
	Zinc, St. Louis.....	6.32 1/2	6.35	6.37 1/2	6.37 1/2	6.37 1/2	6.37 1/2

*Refinery quotation; delivered price 1/4 c. higher.

NEW YORK, Aug. 23.—All the markets except tin are very quiet. There is very little buying of copper from any source and prices are a little lower. Buying of tin has been fairly heavy at receding quotations. Lead is distinctly easier and prices are lower in the outside market. Inactivity in zinc is still pronounced and prices are lower.

Copper.—Consumers, both domestic and foreign, still refuse to be interested to any extent in the market. The small demand which comes to the surface from day to day is being met by one or two companies which are willing to sell electrolytic copper at 13.12 1/2 c., delivered in the Connecticut Valley, which we quote as the market. Several producers will not take any business at less than 13.25 c. and others at not less than 13.37 1/2 c., delivered. The quotation of Copper Exporters, Inc., is still unchanged at 13.65 c., c.i.f. Hamburg. Although the market in general appears to be somewhat weak on the surface, responsible opinion is to the effect that fundamentally it is strong, both statistically and otherwise. The present weakness is regarded also as temporary and the fact that mine production has been gradually reduced in the last few months is pointed to as a bullish factor. Lake copper is lower at 13.25 c., delivered.

Tin.—Decided activity has pervaded this market during the past week and sales for the calendar week ended Saturday totaled about 1700 tons. About one-third of this was taken by consumers with the rest

purchased by dealers. Evidently several dealers covered their short position. Demand for spot and August delivery is light with September delivery a little more active. The largest buying has been for October-November-December. As usual Saturday was decidedly dull, but yesterday, Monday, about 200 tons changed hands in a fairly quiet market. About one-half of this was Straits tin with the rest mostly 99 per cent quality. Today the market has been only moderately active with spot Straits tin quoted at 63.75 c., New York. London quotations today were again lower than a week ago with spot standard quoted at £289 2s. 6d., future standard at £284 2s. 6d. and spot Straits at £293 2s. 6d. The Singapore price today was £290 7s. 6d. The lower prices both here and in London are due to several causes, the principal one being larger stocks of metal at both locations. Arrivals thus far this month have been 5586 tons with 5422 tons reported afloat.

Lead.—Distinctly easy is the general characterization of this market. There is very little demand and the metal is easy to buy at 6.30 c., in the outside market, or 6.65 c., New York. Demand is much lighter than it has been and an expected reduction in the quotation of the leading interest has not materialized. It still stands at 6.75 c., New York, as the contract price.

Zinc.—Buyers are decidedly indifferent and there has been very little business reported. Prime Western zinc is obtainable as low as 6.32 1/2 c., St. Louis, or 6.67 1/2 c., New York. There have been fairly heavy dealings in ore in the Joplin district at \$42 to \$43 per ton. The statistical position is strong, as indicated last week, and producers are not forcing the issue.

Antimony.—The market is quiet and Chinese metal is quoted at 11.62 1/2 c., New York, duty paid, for all positions, both spot and future.

Nickel.—Ingot nickel in wholesale lots is quoted at

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig.....	65.50c. to 66.50c.
Tin, bar	67.50c. to 68.50c.
Copper, Lake	14.75c.
Copper, electrolytic	14.50c.
Copper, casting	14.00c.
Zinc, slab	7.75c. to 8.75c.
Lead, American pig	8.00c. to 9.00c.
Lead, bar	10.00c. to 11.00c.
Antimony, Asiatic	13.50c. to 14.50c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure).....	27.00c. to 28.00c.
Aluminum ingots, No. 12 alloy.....	26.00c. to 27.00c.
Babbitt metal, commercial grade.....	30.00c. to 40.00c.
Solder, 1/2 and 1/2	41.50c. to 42.50c.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.....	68.75c.
Tin, bar	70.75c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting	13.25c.
Zinc slab	7.75c.
Lead, American pig	7.75c.
Antimony, Asiatic	18.00c.
Lead, bar	9.50c.
Babbitt metal, medium grade.....	21.75c.
Babbitt metal, high grade.....	73.75c.
Solder, 1/2 and 1/2	39.75c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.25c. to 19.00c.
Copper, hot rolled	22.00c. to 23.00c.
Copper, cold rolled, 14 oz. and heavier,	24.25c. to 25.25c.
Seamless Tubes—	
Brass	23.12 1/2 c. to 24.12 1/2 c.
Copper	24.00c. to 25.00c.
Brazed Brass Tubes	26.25c. to 27.25c.
Brass Rods	16.00c. to 17.00c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks.....	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products are still being quoted at the advances of Aug. 3. Zinc sheets and lead full sheets have not been changed since Aug. 5 and July 30 respectively.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to
75c. per 100 Lb. Allowed on Shipments
of 500 Lb. or Over

Sheets—	
High brass	18.25c.
Copper, hot rolled	22.00c.
Zinc	10.00c.
Lead (full sheets).....	10.25c. to 10.50c.
Seamless Tubes—	
High brass	23.12 1/2 c.
Copper	24.00c.
Rods—	
High brass	16.00c.
Naval brass	18.75c.
Wire—	
Copper	15.25c.
High brass	18.75c.
Copper in Rolls	21.00c.
Brazed Brass Tubing	26.25c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide.....	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19.25c.
Copper, hot rolled	22.00c.
Copper, cold rolled, 14 oz. and heavier	24.25c.
Zinc	11.00c.
Lead, wide	10.25c.
Seamless Tubes—	
Brass	24.62½c.
Copper	25.50c.
Brazed Brass Tubes	28.50c.
Brass Rods	16.00c.

35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 26c. per lb., delivered.

Non-Ferrous Metals at Chicago

Aug. 23.—This market is quiet and prices, with the exception of zinc, are lower. Old metals are dull and prices are weak.

Prices, per lb., in carload lots: Lake copper, 13.35c.; tin, 66c.; lead, 6.50c.; zinc, 6.50c.; in less-than-carload lots, antimony, 13.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 6.75c.; lead pipe, 5c.; zinc, 3.50c.; pewter, No. 1, 34c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 13.25c.; all being dealers' prices for less-than-carload lots.

Foundry Merchandising and Budgets

(Concluded from page 495)

Lenz said that a scrap loss of 1 per cent in the gray iron foundry amounts to \$8,600 per month and a 1 per cent loss in core scrap amounts to \$3,900 per month. The core room loss at one time reached over 20 per cent, yet with efficient methods this has been cut down to about 3½ per cent.

Readiness-to-Serve Charge

A minimum handling or invoicing charge for small orders was urged in a paper presented by W. J. Donnelly, George H. Smith Steel Casting Co., Milwaukee, and read by C. C. Smith, Toledo Steel Casting Co. The author pointed out that various items of overhead expense are as much for a small order as for a large one. Many small orders are taken at a loss, and foundries should be urged to make a minimum handling charge as developed by cost data prepared in their respective plants. Some foundries have determined the cost of filling small orders and have fixed a minimum charge of \$2.50 to \$3.

James A. Murphy in commenting on the papers said that foundry conditions are bad and the foundries themselves are to blame. He held that the trouble is that they do not know their costs and take orders below cost.

"Labor Management" was the subject of a paper by Willis Wissler, Bureau of Business Research, Ohio State University, Columbus. He referred to labor budgeting as one of the recent developments in industry. When a labor budget is made up the employer knows his needs in labor the same as he knows his requirements in material from his material budget. He should know conditions in the labor market and check these with experiences in his own plant.

S. W. Utley, president American Foundrymen's Association and vice-president and manager of the Detroit Steel Casting Co., speaking at the banquet held Friday evening, followed this general subject. Referring to one phase of the industrial situation he said: "It seems to me that one of the gravest charges which can be brought against industry today is the fact that it takes too little of profits. Too often these are the last things its leaders are considering. Industry is thinking too constantly of the things it is making, of more automobiles, of more houses, of more tonnage, of more anything it can sell to society to supply society's needs and wants and I suspect that

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.25c.	12.75c.
Copper, heavy and wire	11.00c.	12.00c.
Copper, light and bottoms	9.50c.	10.50c.
Brass, heavy	7.00c.	8.50c.
Brass, light	5.50c.	7.25c.
Heavy machine composition	8.75c.	10.125c.
No. 1 yellow brass turnings	7.75c.	8.25c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	5.50c.	6.00c.
Lead, tea	4.50c.	5.00c.
Zinc	4.00c.	4.50c.
Sheet aluminum	13.50c.	15.50c.
Cast aluminum	13.50c.	15.50c.

one change which is coming the next few years is that leaders in industrial life will have to think not less of profits, but more of them; that they will have to begin to pay more attention to the proper reimbursement of those who as stockholders have contributed their stored up labor in the form of capital."

FABRICATED STRUCTURAL STEEL

Contracting Has Fallen Off From Recent High Rate—17,000 Tons in Week

With total fabricated steel contracts of 17,000 tons, the past week was considerably below the average of recent weeks. There were no awards of outstanding size. New projects up for bids totaled 35,500 tons, including 10,000 tons for a power plant at Hammond, Ind., and 4800 tons for a viaduct in Newark, N. J., and 3500 tons for an office building in Houston, Tex. Awards follow:

NEW YORK, 340 tons, four apartment buildings, Girard Avenue and 161st Street, to H. Schacht & Sons.
NEW YORK, 330 tons, apartment building, Kingsbridge Terrace and 230th Street, to Kingsbridge Iron Works.
NEW YORK, tonnage unstated, Yellow Taxi Cab garage, 514 East Twenty-third Street, to Hammer Structural Steel Co.
NEW YORK, tonnage unstated, bus terminal, Fiftieth to Fifty-first Street, between Broadway and Eighth Avenue, to Triangle Iron Works.
NEW YORK, 900 tons, settlement house on Ninth Street, to Taylor-Fichter Steel Construction Co.
NEW YORK, 1400 tons, office building on Forty-eighth Street, to Levering & Garrigues Co.
NEW YORK, 1000 tons, addition to Fordham Hospital, to Hinkle Steel Construction Co.
NEW YORK, 175 tons, boiler house on city pier No. 28, to American Bridge Co.
BROOKLYN, 125 tons, bridge for Brooklyn-Manhattan Transit Co., to Fort Pitt Bridge Co.
ST. ALBANS, L. I., 350 tons, public school No. 136, to Bethlehem Fabricators, Inc.
LONG ISLAND RAILROAD, 100 tons, Ketchams Road bridge, to Bethlehem Steel Co.
LONG ISLAND RAILROAD, 200 tons, bridge, to Fort Pitt Bridge Co.
ALBANY, N. Y., 300 tons, Teachers' College, to Eastern Bridge & Structural Co.
ATLANTIC CITY, N. J., 500 tons, bridge over Rancocas Creek, State highway route No. 3, to Fort Pitt Bridge Co.
CLEVELAND, 300 tons, Carlin store and office building, to McClintic-Marshall Co.
NEW YORK, CHICAGO & ST. LOUIS RAILROAD, 150 tons, bridge at Muncie, Ind., to Mount Vernon Bridge Co.
COLUMBUS, OHIO, 700 tons, Beggs Building, to Mount Vernon Bridge Co.
BRIDGEPORT, CONN., 1000 tons, savings bank, to Hedden Iron Construction Co.
NORWALK, CONN., 200 tons, hospital, to American Bridge Co.
PENNSYLVANIA RAILROAD, 200 tons, bridge, to Jones & Laughlin Steel Corporation.
CLEVELAND, 107 tons, Notre Dame School, to Massillon Bridge & Structural Co.
DETROIT, 177 tons, Durfee School, to Massillon Bridge & Structural Co.
PITTSBURGH, 300 tons, Bare Chance Dam, United States Engineers, to Independent Bridge Co.

MEMPHIS, TENN., 335 tons, two barges for Anderson Tully Co., to American Bridge Co.
 CHICAGO, 140 tons, Riverside Zoo buildings to the Gage Structural Steel Co., local.
 CHICAGO, 450 tons, Englemann building to the Gage Structural Steel Co., local.
 CHICAGO, 150 tons, buildings for Riverside Park to the Mississippi Valley Structural Steel Co.
 TULSA, OKLA., 2600 tons, Exchange National Bank Building to McClintic-Marshall Co.
 STATE OF IDAHO, 100 tons, highway bridges for United States Department of Public Roads, to an unnamed fabricator.
 LANE COUNTY, ORE., 105 tons, bridge across Deadwood Creek, to an unnamed interest.
 SAN FRANCISCO, 2000 tons, department store for O'Connor & Moffatt, to United States Steel Products Co.
 SAN FRANCISCO, 190 tons, plant for Bauer Cooperage Co., to Michel & Pfeffer Iron Works, local.
 AZUSA, CAL., 175 tons, municipal pipe line, to Baker Iron Works.
 TACOMA, WASH., 937 tons, municipal pipe line, to Birchfield Boiler Co., local.
 TACOMA, 800 tons, waterworks, to Bethlehem Steel Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

STAMFORD, CONN., 550 tons, building for Stamford Gas & Electric Co.; reported last week as let to an unnamed fabricator.
 BOSTON & MAINE RAILROAD, 200 tons, bridges.
 NEW YORK, 1000 tons, American Railway Express building for New York, New Haven & Hartford Railroad, Harlem River and 132nd Street.
 NEW YORK, 800 tons, apartment building, 113-121 East Eighty-sixth Street.
 NEW YORK, 400 tons, Craig Theater, Fifty-third to Fifty-fourth Street.
 NEW YORK, 200 tons, sanitarium, 123 West 110th Street.
 NEW YORK, 300 tons, factory addition for F. H. Bennett Biscuit Co. at Tenth Street and Avenue D.
 GLENWOOD, L. I., 500 tons, power house for Long Island Lighting Co.
 MASPETH, L. I., 500 tons, factory building.
 NEWARK, N. J., 4800 tons, viaduct for Public Service Co. of New Jersey.
 JOHNSON CITY, N. Y., 300 tons, high school.
 ERIE RAILROAD, 100 tons, bridge.
 WASHINGTON, 500 tons, high school.
 BALTIMORE & OHIO RAILROAD, 1400 tons, several bridges.
 HAMMOND, IND., 10,000 tons, power plant for State Line Generating Co.
 MERCHANTVILLE, PA., 875 tons, vocational school building.
 ST. PAUL, MINN., 700 tons, building for the Russell Grader Co.
 HOUSTON, TEX., 3500 tons, office building.
 OGDEN, UTAH, 200 tons, bridges for the Union Pacific. This is in addition to the tonnage reported last week.
 ST. LOUIS, 200 tons, shops for the Missouri Pacific.
 ST. LOUIS, 900 tons, building for Ward Baking Co.
 CHICAGO, 400 tons, Oakwood Boulevard viaduct.
 CHICAGO, 500 tons, first two floors of Chicago Evening Post Building.
 GREAT NORTHERN RAILWAY, 2300 tons, bridges.
 MILWAUKEE, 1200 tons, public safety building.
 DENVER, COLO., 500 tons, Aztetic Apartments.
 OAKLAND, CAL., 500 tons, Women's City Club; bids in.
 OAKLAND, 325 tons, Mutual Stores Inc.; bids in.
 SAN FRANCISCO, 100 tons, Physicians' Building; bids in.
 SAN FRANCISCO, 500 tons, boxing arena; bids in.
 ASTORIA, ORE., 1500 tons, pulp mill for Rainier Pulp & Paper Co.; bids opened Aug. 10.
 SEATTLE, WASH., 1200 tons, auditorium, bids to be asked early in September.
 KELSO, WASH., 1200 tons, grain elevator; bids in.

Railroad Equipment

The Great Northern will build 200 box cars in its own shops at Superior, Wis.

The Chicago, Milwaukee & St. Paul has ordered 10 gas-electric motor cars, 5 each from the Pullman Car & Mfg. Corporation and the Standard Steel Car Co.

The Boston & Maine Railroad has ordered 10 8-wheel, 2-cylinder type switching engines from the Baldwin Locomotive Works.

The Northern Pacific will buy 200 underframes for flat cars.

REINFORCING STEEL

Awards of 8,750 Tons Include Three Projects of 1000 Tons Each

The week's awards of about 8750 tons of concrete reinforcing bars include three projects of 1000 tons each: A warehouse for the Illinois Bell Telephone Co. in Chicago, a bridge at Quincy, Ill., and a building for the Mergenthaler Linotype Co. in Brooklyn. New projects up for bids total 1050 tons. Awards follow:

BROOKLYN, 1000 tons, building for Mergenthaler Linotype Co.; 75 tons to Carroll-McCreary Co., Inc., and remainder reported to have gone to E. T. Edwards, Columbia, Pa.
 PHILADELPHIA, 760 tons, two public school buildings, to Concrete Steel Co.
 PHILADELPHIA, 650 tons, loft building on Eleventh Street, to American Steel Engineering Co.
 CLEVELAND, 100 tons, factory for Marble & Shattuck Chair Co., to Bourne-Fuller Co.
 ROCHESTER, N. Y., 250 tons, Masonic Temple, to a Buffalo maker.
 BUFFALO, 600 tons, New York Central Railroad passenger station, to Truscon Steel Co.
 CHICAGO, 300 tons, State Line Generating Co. power plant, to Kalman Steel Co.
 CHICAGO, 1000 tons, warehouse for Illinois Bell Telephone Co., to Concrete Engineering Co.
 CHICAGO, 113 tons, Congress Street bridge, to Jones & Laughlin Steel Corporation.
 ST. PAUL, MINN., 650 tons, building for Cream of Wheat Co., to American System of Reinforcing.
 MILWAUKEE, 500 tons, Catholic institution, to American System of Reinforcing.
 MILWAUKEE, 100 tons, viaduct for Chicago, Milwaukee & St. Paul Railroad, to Concrete Engineering Co.
 QUINCY, ILL., 1000 tons, bridge footings, to C. A. P. Turner.
 MOLINE, ILL., 150 tons, building for Montgomery Electric Co., to Concrete Engineering Co.
 MOLINE, ILL., 200 tons of rail steel bars, building for Deere & Co., to Republic Iron & Steel Co.
 OAK PARK, ILL., 100 tons of rail steel, Golder Apartments, to Concrete Engineering Co.
 DETROIT, MICH., 150 tons, school, to Concrete Engineering Co.
 LOS ANGELES, 120 tons, apartment building at 2315 South Flower Street, to an unnamed local company.
 SEATTLE, WASH., 700 tons, Exeter Apartment building and State and municipal work, to Pacific Coast Steel Co.
 SEATTLE, 300 tons, apartment building and State and municipal work, to Northwest Steel Rolling Mills, Inc.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

PHILADELPHIA, 850 tons, building for General Baking Co.
 OHIO, 200 tons, State Highways Commission, bridge over Maumee River.
 BUFFALO, 100 tons, school No. 51; bids asked.
 WARREN, PA., 100 tons, Russell garage; bids asked.
 CHICAGO, 300 tons, high school on Sacramento Boulevard.
 CHICAGO, 300 tons, apartment building at 436 Wellington Avenue; Halperin & Braun, architects.
 SEATTLE, 225 tons, Mount Diablo dam; bids Sept. 9.
 KELSO, WASH., tonnage unstated, grain elevator.

Buffington Harbor, Buffington, Ind., the first private harbor to be built on Lake Michigan in 20 years and one of only three such harbors on the Great Lakes, was the objective of more than a thousand engineers, architects, contractors, public officials and others interested in the construction field, who as guests of the Western Society of Engineers, Chicago, participated in a boat cruise and inspection trip.

"Basic Principles in Managing Men" is the leading article in the August issue of Executives Service Bulletin, published by the Metropolitan Life Insurance Co., New York. It was written by S. A. Lewisohn, chairman American Management Association, and vice-president Miami Copper Co. He criticises, as a main fault in administration, the tendency to be autocratic.

PERSONAL

Martin J. Beirn has been appointed vice-president and general manager of sales for the American Radiator Co., New York, succeeding Rudolph B. Flershem, who resigned recently to become vice-president of the Marine Trust Co., Buffalo. Mr. Beirn became associated with the Radiator company in its sales department more than 25 years ago and has been successively branch manager, assistant treasurer and assistant manager of sales. His headquarters will be at the company's New York offices. W. M. Scudder has been appointed vice-president sales for the company with headquarters in Chicago. His association with the organization also dates back to the beginning of the century.

J. H. Hillman, Jr., chairman of the Hillman Coal & Coke Co., Pittsburgh, left recently for a vacation in Europe.

H. M. Foster, for some time associated with R. C. Hoffman & Co., Baltimore, iron and steel merchants, and more recently with H. M. Foster & Co., Baltimore, dealers in steel rails, track supplies and other iron and steel products, has been appointed Southern district sales manager for the Central Iron & Steel Co., Harrisburg, Pa., and will have headquarters in the Continental Building, Baltimore.

Kennedy H. Crumrine, recently superintendent of the Cleveland plant of the National Acme Co., has been appointed works manager of the Gisholt Machine Co., Madison, Wis., and W. H. Halliwell, formerly assistant superintendent of the General Iron Works, Denver, Colo., has been made superintendent of the Gisholt company. Charles H. Johnson, who for many years was the company's European sales manager and more recently has been vice-president in charge of production, will devote his attention to the larger aspects of the firm's business.

H. J. Kelly has been appointed district sales representative in Cleveland for the Seneca Iron & Steel Co., Buffalo, and will maintain headquarters at 515 Swetland Building, Cleveland.

John Jurgensen, for many years identified with the New York office of the Falk Corporation, Milwaukee, has been placed in charge of the new office recently opened by the company at 720 Terminal Sales Building, Twelfth and Morrison Streets, Portland, Ore.

Francis F. Lucas, in charge of micrographic work for Bell Telephone Laboratories, New York, sailed on the Lapland Aug. 20. Before the International Congress for Testing Materials at Amsterdam, Holland, he will present a paper on some of the laboratories' recent pioneer work in magnification of 6000 diameters and more, particularly with the aid of ultra-violet light. Mr. Lucas is the holder of two medals for his contributions to high-power photomicrography. While overseas, he will confer with scientists of the famous Zeiss optical works at Jena, Germany, who are collaborating in the development of instruments for his work. He will also visit leading European laboratories.

E. R. Ramsey, heretofore in charge of the metallurgical division of the Dorr Co., New York, in Denver, Colo., has been appointed assistant general sales manager with headquarters in New York. A. D. Marriott, who has been assistant manager of the metallurgical division, will succeed Mr. Ramsey and will continue with headquarters in Denver. A. T. Hastings has been made assistant manager of the metallurgical division and will also continue in charge of the company's Los Angeles office.

Joseph D. Grant, president Grant Co., San Francisco, has been elected president of the Columbia Steel Corporation of that city, to fill the unexpired term

ending next spring of the late Wigginton E. Creed. D. H. Botchford, second vice-president, has been elected first vice-president and general manager, and C. G. Dall, general counsel of the corporation has been named a member of the board of directors. Mr. Grant is vice-president of the Coast Counties Gas & Electric Co. and the Contra Costa Gas Co., and a director of the Bank of California, Bankline Oil Co., California Academy of Sciences, California-Oregon Power Co., First National Bank of San Jose, Stanford University and the Norwalk Co. He was born in San Francisco March 28, 1858, attended the University of California and later studied at the Sorbonne in Paris.

Dr. Richard Moldenke, Watchung, N. J., has sailed for Europe and will be absent for about two months on professional business.

H. S. Kartsher has resigned as supervisor of shop engineering standards for the White Motor Co. to open an office at 3211 Sycamore Road, Cleveland, under the firm name of "K" Standards Service, which will specialize in assisting manufacturers with standardization problems. During the war Mr. Kartsher was associated with Col. E. C. Peck in the gage section of the Ordnance Department, thereafter serving for more than four years as mechanical engineer of the Cleveland Twist Drill Co. In 1923 he joined the engineering staff of the White Company where he installed its present system of limits and gage control as well as the specification system for the purchase of shop tools and equipment.

Percival Roberts, Jr., member of the Finance Committee of the United States Steel Corporation, returned from Europe last week on the Aquitania.

Frank B. Ward, for 15 years representative in Pittsburgh of the Elwell-Parker Electric Co., Cleveland, has retired, and the Arch Machinery Co., Park Building, will now represent the company in Pittsburgh. J. P. Lyons, formerly in the Elwell-Parker company's Atlanta office, has been transferred to New York, and will be succeeded at Atlanta by F. W. Ream. J. S. Cothran has been appointed the company's representative at Charlotte, N. C., with headquarters in the Commercial Bank Building. The Baltimore office, Citizens National Bank Building, has been taken over by J. T. Carroll, formerly general superintendent of motive power of the Baltimore & Ohio Railroad.

James A. Burden, New York, president Burden Iron Co., is spending the summer in Europe.

H. A. Lynch, for the last eight years associated with the Dorr Co., New York, engineer, has been placed in charge of a service department recently established by the company for the purpose of giving its customers specialized assistance in connection with the installation and initial operation of its equipment. He has had a wide experience in chemical, metallurgical and industrial operations in this country as well as in South America and Europe.

R. H. McGredy has been appointed sales manager of the Lo-Hed hoist division, American Engineering Co., Philadelphia.

Howard Coonley, president Walworth Co., Boston, is a director of the Colonial Air Transport Co., a company engaged in transporting merchandise by airplane.

L. E. Block, chairman Inland Steel Co., Chicago, is in Europe.

Donald L. Bartlett, assistant purchasing agent Stanley Works, New Britain, Conn., has been made president of the Third Ward Republican Club, New Britain. He succeeds Isaac Black, general manager Russell & Erwin Division of the American Hardware Corporation.

E. H. Schmitz, since 1925 engaged in experimental developments for the Riley Stoker Corporation, Worces-

ter, Mass., has been appointed Pittsburgh district manager for the company. He is a graduate of the Massachusetts Institute of Technology and was employed for a time in the combustion engineering department of the Sinclair Oil Co. at Houston, Tex. Before joining the Riley organization he was associated with the Tennant Co., Houston, consulting engineer, specializing in power plant work.

Joseph F. Savage has been made manager of sales and William M. McFate, assistant manager of sales of the strip steel sheet department recently created within the sales organization of the Weirton Steel Co., Weirton, W. Va. Mr. Savage was formerly connected with the American Tube & Stamping Co., Bridgeport, Conn., but more recently has been vice-president of the Hamilton Furnace Co., Hamilton, Ohio, with headquarters at Cincinnati. Mr. McFate was formerly associated with the Trumbull Steel Co., Warren, Ohio.

George W. Dulany, Jr., president of the Climax Engineering Co., Clinton, Iowa, has been made chairman of the company's board of directors, and Edward F. Deacon has been named to succeed him as president. Mr. Deacon was formerly president of the Brecht Co., St. Louis, and for a number of months has been assistant to Mr. Dulany at the G. W. Dulany Trust offices in Chicago. W. E. Eberhart, Jr., has been elected treasurer of the Climax company succeeding M. M. Cruise, Chicago, who has resigned.

Ledyard Heckscher, president Alan Wood Iron & Steel Co., Widener Building, Philadelphia, has resigned. He had been connected with the company since 1911, when it took over the assets of Richard Heckscher & Sons Co., which owned the Swede blast furnaces at Swedeland, Pa. For some time Mr. Heckscher was vice-president of the company and was in charge of blast furnace operations. No successor has been appointed, but a meeting of the board of directors is scheduled for Aug. 30, at which time some action may be taken.

Concrete Reinforcing Institute to Meet at Detroit

The semi-annual meeting of the Concrete Reinforcing Steel Institute will be held at the Aviation Country Club, near Detroit, Sept. 19-21. The club is situated in the inland lake district about 30 miles from the city.

Two principal addresses are scheduled: "Selling—Markets—Profits," by E. St. Elmo Lewis, sales and merchandising counsellor, Detroit, on Monday evening, Sept. 19, and "The Future of Reinforced Concrete," by F. R. McMillan, director of research, Portland Cement Association, at 10 a. m., Tuesday, Sept. 20. The latter address will be supplemented by a motion picture, "The Manufacture of Portland Cement."

A banquet is to be held in the evening of Sept. 20 and the board of directors will meet Monday morning, Sept. 19. Golf will be indulged in each afternoon with a tournament on Sept. 21.

Automobile Production Falls Still Lower

Production of automobiles in the United States in July is reported by the Department of Commerce at 233,425 passenger cars and 29,981 trucks. Both figures represent sharp declines from June and also from July, 1926. The revised figures for June are 273,718 passenger cars and 40,265 trucks. For July of last year production was 317,006 cars and 37,388 trucks.

Canadian production in July, as reported by the Dominion Bureau of Statistics, was 8719 passenger cars and 2268 trucks, both being far below the output of the preceding month.

For the first seven months of the calendar year production of passenger cars in the United States has aggregated 2,012,103, a decline of 15.7 per cent from the 2,387,424 of the first seven months of 1926. Trucks at 278,574 are 2 per cent above last year's 272,847 to the end of July. Passenger cars are not only behind last year, but they are behind both 1925, with 2,203,905 units, and 1923, with 2,128,369 units, in the first seven months. Trucks, however, have been produced this year in larger numbers than ever before.

OBITUARY

WILLIAM F. PAGEL, president and general manager of the Turner Brass Works, Sycamore, Ill., who died on Aug. 5, was prominently identified with the field of gasoline combustion, particularly in the design and manufacture of carburetors for automotive uses. In the early part of his career he was active in the development of gasoline and kerosene burning blow torches and fire pots, and a large percentage of the patents on this type of construction now in use bear his name. He became identified with the Turner organization in 1913 as general manager, and in 1920 he and his son, Herbert F. Pagel, purchased the business. The younger Mr. Pagel will succeed his father as president and general manager of the company.



WILLIAM F. PAGEL

CHARLES A. HAUCK, secretary of the New York Iron and Steel Association and of the Roofers and Sheet Metal Jobbers Credit League, New York, died on Aug. 16 at his home in Woodhaven, Queens. He was also prominently identified with the Hardware Board of Trade, Ltd., New York, and had served as its actuary for several years.

FELIX M. CRUCIGER, in charge of sales of cold rolled sheets, bars and specialties, Crucible Steel Co. of America, died in New York Aug. 16. He had been identified with that company since its organization 27 years ago, and previously had been with the Park Steel Works, Pittsburgh, which in 1900 became one of the constituent companies of the Crucible company. He was attached to the general sales department of the latter company in Pittsburgh until 1911, when he was transferred to the New York office and subsequently placed in charge of sales of the products of the Spalding & Jennings mill of the company at Jersey City. He was born in Goethe, Germany, in 1884. A brother, Charles F. Cruciger, is vice-president and treasurer of Spang, Chalfant & Co., Inc., Pittsburgh.

J. HOWARD AYER, division superintendent in charge of tool departments, General Electric Co., Pittsfield, Mass., died suddenly on Aug. 19 at his home in that city. He was born at Wyndham, Me., 48 years ago and had been associated with the General Electric Co. since 1907.

JAMES T. HUNT, president Hunt & Dorman Mfg. Co., Cleveland, died at his winter home in St. Petersburg, Fla., Aug. 20. He was 82 years of age and had been identified with the metal industry in Cleveland for 50 years. He was born at Springfield, Mass., and located at Cleveland in 1872, where he began the manufacture of tinware with his brother, H. B. Hunt. This business was succeeded by H. B. Hunt Stamping Co., which was afterwards absorbed by the American Can Co.

The present outlook for shipping shows substantial progress toward stability, according to A. E. Sander-son, of the Transportation Division, United States Department of Commerce. Only a relatively small amount of tonnage remains to be absorbed into trade and, if the output of tonnage is not inflated, he expects an early restoration of the balance between ships and cargoes.

British Reduce Pig Iron Prices

Special Concession on 500-Ton Export Orders to Recapture Markets—French Await Fall Business Revival

(By Cable)

LONDON, ENGLAND, Aug. 22.

CLEVELAND pig iron consumers were surprised by the announcement that producers had reduced prices of foundry and forge grades by 2s. 6d. (60c.) per ton, with a supplementary decrease of a similar amount for export orders exceeding 500 tons.

Because of the holidays there has been no indication of the probable effect of what is evidently an effort to regain lost markets. There is better demand for hematite and prices are steady. Foreign ore is quiet. The Swedish Grangesberg interests have made record ore exports in July of 1,110,000 tons of iron ore, principally because of the unusual German demand.

Finished iron and steel markets are unchanged and quiet, and buyers awaiting the outcome of the next price meeting of makers. Meanwhile new buying is

limited, but most mills are still operating at a good rate.

The tin plate market is rather dull again and business is small with buyers attempting to force lower prices but without much success.

Galvanized sheets are in only moderate demand. Although India recently showed interest, the market continues steady. Black sheets are quiet and inactive.

Continental steel prices are firm and makers are well booked for the present scale of production. Consequently many are adopting a firmer attitude in expectation of a livelier demand in the fall. Some large Belgian works, however, have laid off shifts two or three days a week. In France the De Wendel works is demanding a home market quota although in the past this company has been able to export all its surplus pig iron. This is causing some anxiety to French producers generally.

FRENCH MARKET QUIET

Improvement Expected in Fall—Prices Substantially Unchanged—Pig Iron Quiet

PARIS, FRANCE, Aug. 12.—Iron and steel business is extremely quiet and prices continue to show softness. With the revival of demand expected in the fall, however, producers believe that concessions on small tonnages will be less common. On large orders, few of which have appeared lately, makers show a willingness to offer drastic reductions in price to secure the business. This has been caused in part by the depressed conditions in nearby steel-producing countries, which are offering low prices at export. Germany is at present rather well occupied with domestic business and less competitive than other European sellers. Export business has been slightly better in the past week.

Pig Iron.—Demand is moderate and the allotments of phosphoric foundry and hematite irons for the

domestic market have not been entirely taken for the current month. While consumers are seeking lower prices, producers claim that any reduction at present would have but little effect on the market as there is insufficient activity among consumers to provide much additional business. The Entente of Phosphoric Foundry Pig Iron Producers was recently faced with a serious situation by the demand of the De Wendel works for an allotment to sell pig iron in the domestic market. For the past two years this company has been producing foundry iron for export and only recently decided to enter into competition for domestic tonnages. The entente threatened to be disrupted but an agreement is expected in a few days. The report recently published in a French newspaper that a reduction of 7s. 6d. (\$1.82) per ton would be allowed to purchasers of 5000 tons or more of phosphoric foundry iron is denied. Denial has also been made of the report that the Essen Pig Iron Syndicate had decided to sell German hematite iron to Switzerland at 92 Swiss francs per ton, the same price as the quotation

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.85 per £ as follows:

Durham coke, del'd. f.o. 19s.				\$4.60		
Bilbao Rubio ore†..	1 1	to £1 1 1/4s.		5.09	to	\$5.15
Cleveland No. 1 fdy.	3 10			16.97*		
Cleveland No. 3 fdy.	3 7 1/2			16.36*		
Cleveland No. 4 fdy.	3 6 1/2			16.12*		
Cleveland No. 4 forge	3 6			16.00*		
Cleveland basic	3 15	to 3 15 1/2		18.18	to	18.30
East Coast mixed..	3 15 1/2			18.30		
East Coast hematite.	3 16			18.42		
Rails, 60 lb. and up.	7 15	to 8 0		37.58	to	38.80
Billets	6 0	to 6 10		29.10	to	31.53
Ferromanganese	12 0			58.20		
Ferromanganese (export)	10 15	to 11 0		52.13	to	53.35
Sheet and tinplate bars, Welsh	5 12 1/2	to 5 15		27.27	to	27.88
Tinplate, base box..	0 18 1/2	to 0 18 3/4		4.46	to	4.52
Black sheets, Japanese specifications	13 15	to 14 0		66.68	to	67.90
Ship plates	7 12 1/2	to 8 2 1/2		1.65	to	1.76
Boiler plates	10 10	to 11 0		2.28	to	2.39
Tees	8 2 1/2	to 8 12 1/2		1.76	to	1.87
Channels	7 7 1/2	to 7 17 1/2		1.60	to	1.70
Beams	7 2 1/2	to 7 12 1/2		1.54	to	1.65
Round bars, 3/4 to 3 in.	7 12 1/2	to 8 2 1/2		1.65	to	1.75
Steel hoops	10 10	to 11 0		2.28	to	2.39
Black sheets, 24 gage	10 5	to 10 10		2.22	to	2.28
Galv. sheets, 24 gage	13 15	to 14 0		2.98	to	3.03
Cold rolled steel strip, 20 gage, nom.	14 0	to 14 5		3.03	to	3.09

* Export price, 2 1/4s. less for 500 tons or more.

† Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports (Per Metric Ton)

Foundry pig iron: (a)						
Belgium	£3 0s.	to £3 0 1/2s.	\$14.55	to	\$14.67	
France	3 0	to 3 0 1/2	14.55	to	14.67	
Luxembourg	3 0	to 3 0 1/2	14.55	to	14.67	
Basic pig iron:						
Belgium	2 19	to 3 0	14.31	to	14.55	
France	2 19	to 3 0	14.31	to	14.55	
Luxembourg	2 19	to 3 0	14.31	to	14.55	
Coke	0 18		4.37			
Billets:						
Belgium	4 8	to 4 9	20.85	to	21.34	
France	4 8	to 4 9	20.85	to	21.34	
Merchant bars:						
Belgium	4 15		1.04			
France	4 15		1.04			
Luxembourg	4 15		1.04			
Joints (beams):						
Belgium	4 13		1.01	to	1.04	
France	4 13		1.01	to	1.04	
Luxembourg	4 13		1.01	to	1.04	
Angles:						
Belgium	4 12 1/2	to 4 14 1/2	1.01	to	1.03	
1/2-in. plates:						
Belgium (a)	6 5	to 6 6	1.36	to	1.37	
Germany (a)	6 5	to 6 6	1.36	to	1.37	
3/8-in. ship plates:						
Belgium	6 1		1.31			
Luxembourg	6 1		1.31			
Sheets, heavy:						
Belgium	6 1		1.31			
Germany	6 1		1.31			

(a) Nominal.

of French, Belgian and Luxemburg furnaces for phosphoric foundry iron. It appears probable that an agreement will soon be reached by which allotments will be made on export tonnages of pig iron from French, Belgian and Luxemburg works. This, it is believed, might provide the nucleus for an International pig iron syndicate, including Germany, but exclusive of Great Britain.

Semi-Finished Material.—There has been a slight improvement in export demand but purchasing is still moderate and desirable orders are not numerous. Blooms are particularly inactive with quotations ranging from £3 19s. to £4 4s. (\$19.15 to \$20.37) per metric

ton. Billets are quoted at £4 5s. to £4 7s. 6d. (\$20.61 to \$21.22) per ton. Mills are apparently less anxious for business despite the quietness of the market.

Finished Material.—Although prices are low and should appeal to buyers as advantageous, demand is limited. The tendency of prices in the domestic market is slightly upward on beams, with bars quiet and unchanged. For export, beams are held at £4 10s. to £4 12s. 6d. per ton (0.99c. to 1.01c. per lb.) and bars at £4 13s. 6d. to £4 14s. (1.03c. to 1.04c. per lb.) Demand for sheets has not shown any improvement but prices are stronger as several mills have temporarily dropped out of competition for business.

Book Reviews

(Concluded from page 489)

all connections are made by plugging into a single electric lamp socket.

Part II, covering 60 pages, deals with the sampling and the analysis of industrial gases with the apparatus described in Part I. A special portable apparatus for the analysis of flue and chimney gases is also described, employing the same pipettes and the same style of manifold as the laboratory apparatus, and is distinguished for its convenience, simplicity of construction, compactness and lightness. It is equipped with an aspirator bulb so that connecting tubing may be flushed and samples drawn directly into the burette and analyzed at once.

Part III includes 33 pages and deals with miscellaneous determinations that cannot be made with the regular gas analysis apparatus, and Part IV, comprising the last 47 pages, deals with the measurement of gases, the calculation of gas volumes under different conditions and a number of problems presented by the combustion of gases.

Economic Problems of Modern Life. By S. Howard Patterson and Karl W. H. Scholz. Pages 615. Published by McGraw-Hill Book Co., New York. Price, \$3.

The authors treat economics as a social science, best studied by induction, and in view of modern entanglement of social and political problems, neither absolutely correct nor entirely incorrect.

Part I, on problems of economic organization, goes into such concrete matters as wash sales, bucket shops, margin buying, and the dangers of the corporate form of business organization. Part II, on problems of monopoly, takes up, among other things, price control, trust practices, the Sherman Act, advantages and disadvantages of public ownership, the Elkins and the Hepburn Acts, and governmental railroad operation. In Part III (Professor Scholz's) devoted to problems of exchange, we find as topics defects of the gold standard, the compensated gold dollar, post-war inflation, price levels and the business cycle, the mechanism of international trade, the payment of foreign debts owed to the United States, the protective tariff, equalization of production costs, and the various arguments in favor of a protective tariff.

In Part IV, also by Professor Scholz, we have consideration of problems of public finance, typical examples being those touching modern tendencies in public expenditures, budget control, borrowing versus taxing to finance wars, proportional versus progressive taxation, Federal estate and excise taxes, and suggested reforms of the general property tax, owing to such defects as the inequity of property assessments, undue taxation of real property, the incentive to dishonesty and perjury, the frequently resulting double taxation, and the fact that often the rate decreases as the base increases.

Part V (like Parts I and II, the work of Professor Patterson) goes very thoroughly into what interests more persons than any of the other problems: those of labor and industrial unrest. Commencing with economic inequality and poverty, it takes up standards of living, the national income and the causes and effects of economic inequality (necessitating consideration of the biological and psychological problem of human differences, the social problems of population and stand-

ards of living, and the economic problem of distribution). Industrial accidents due largely to individual carelessness, and dangerous trades, occupational diseases, maladjustments in labor supply and demand equilibriums, workmen's compensation, insurance and pensions are not neglected; nor are child labor and women's work, the sweat shop, the 8-hr. day, collective bargaining, apprenticeship, strikes, profit sharing, and last but not least, socialism and economic radicalism. Of these latter heads, it is difficult to treat concretely, as there is no adequate definition of either term. As a rule, socialists of all brands do more inveighing against capitalism than proposing definite remedies, although capitalists themselves are constantly proposing and introducing methods of lessening disadvantages (such as human and economic wastes and excessive selling expenses).

There is a tremendous amount of meat in this book, rendered available by an admirable alphabetical index and by what too few books give: for each chapter a list of references, as such, and one of collateral reading, besides a catechism on the immediately preceding chapter.

R. G.

New Books Received

Time and Motion Study and Formulas for Wage Incentives. By Stewart M. Lowry, Harold B. Maynard and G. J. Stegemerten. Pages 377, 6 x 9 in., illustrated. Published by McGraw-Hill Book Co., Inc., New York. Price, \$4.

Foremanship Training. By Hugo Diemer. Pages 230, 4 3/4 x 7 1/4 in. Published by McGraw-Hill Book Co., Inc., New York. Price, \$2.50.

Mechanical Appliances and Novelties of Construction. By Gardner F. Hiscox. Pages 412, 6 x 9 in., illustrated. Published by Norman W. Henley Publishing Co., New York. Price, \$4.

The Cost of Living in Foreign Countries. Pages 402, 6 1/2 x 9 1/2 in. Published by National Industrial Conference Board, Inc., 247 Park Avenue, New York. Price, \$3.50.

Wages in the United States, 1914-1926. Pages 139, 6 1/2 x 9 1/2 in. Published by National Industrial Conference Board, Inc., 247 Park Avenue, New York. Price, \$2.50.

Cost of Government in the United States. Pages 138, 6 1/2 x 9 1/2 in. Published by National Industrial Conference Board, Inc., 247 Park Avenue, New York. Price, \$2.

Metallniederschläge und Metallfärbungen. By F. Michel. Pages 179, 5 1/2 x 8 1/4 in., illustrated. Published by Verlag Springer, Berlin. Price, 6.90 m.

Transactions of the American Institute of Mining and Metallurgical Engineers. Vol. LXXIV. Pages 956, 6 x 9 in., illustrated. Published by the Institute, 29 West Thirty-ninth Street, New York.

La Transformation de L'Energie Electrique. By Rene Carton and Pierre Dumartin. Pages 217, 4 1/2 x 6 3/4 in., illustrated. Published by Armand Colin, 103 Boulevard Saint-Michel, Paris. Price, 11 fr. 90.

"Location, With Special Reference to Raw Materials" is the subject of a 24-page pamphlet prepared by William Miller Booth, engineer, 526 University Block, Syracuse, N. Y. Ores and other mineral wealth are listed, with the States in which each is found. In addition, an analysis is given of the materials available to the early colonists of 300 years ago.

Large Production of Pig Iron in First Half

Increase Over Previous Half Year, but Less Than First Half of 1926

OFFICIAL figures of the American Iron and Steel Institute show production of pig iron and ferro-alloys in the first half of the year to have been 19,567,-

554 gross tons. This compares with 19,356,647 tons in the second half of 1926 immediately preceding, and with 20,016,082 tons in the first half of 1926. The pres-

HALF-YEARLY OUTPUT OF PIG IRON AND FERRO-ALLOYS BY STATES.

HALF-YEARLY PRODUCTION OF PIG IRON BY STATES.*

States.	Blast Furnaces. (a)				Production of pig iron not including ferro-alloys—Gross tons		
	In blast Dec. 31, 1926.	June 30, 1927.			First half of 1926.	Second half of 1926.	First half of 1927.
		In.	Out.	Total			
Massachusetts.....	1	1	0	1	1,329,074	1,270,443	1,317,674
New York.....	16	15	11	26			
New Jersey.....	0	0	3	3			
Pennsylvania.....	62	54	53	107	6,861,089	6,370,801	6,374,364
Maryland.....	5	5	1	6	448,706	432,855	491,589
Virginia.....	1	1	13	14			
Alabama.....	21	18	16	34			
West Virginia.....	0	0	1	1	1,442,882	1,490,914	1,461,562
Kentucky.....	3	3	2	5	288,636	321,523	389,361
Mississippi.....	0	0	1	1			
Tennessee.....	2	3	10	13			
Ohio.....	42	42	22	64	4,618,238	4,643,167	4,418,633
Illinois.....	15	17	9	26	1,836,875	1,819,813	1,840,038
Indiana.....	13	15	3	18	2,277,593	2,099,475	2,337,441
Michigan.....	10	10	1	11			
Wisconsin.....	1	1	5	6			
Minnesota.....	2	2	1	3	266,459	271,040	227,381
Missouri.....	0	0	2	2	310,185	298,649	344,027
Colorado.....	3	3	2	5			
Utah.....	1	1	0	1			
Total.....	199	193	158	351	19,679,737	19,018,680	19,202,070

(a) Completed and rebuilding; ferro-alloy blast furnaces not included

HALF-YEARLY PRODUCTION OF COKE PIG IRON BY STATES.*

States.							
Massachusetts.....	1	1	0	1			
New York.....	16	15	11	26	1,329,074	1,270,443	1,317,674
New Jersey.....	0	0	3	3			
Pennsylvania.....	62	54	53	107	6,861,089	6,370,801	6,374,364
Maryland.....	5	5	1	6	448,706	432,855	491,589
Virginia.....	1	1	13	14			
Alabama.....	20	18	14	32	1,437,069	1,489,680	1,456,798
Texas.....	0	0	1	1			
West Virginia.....	3	3	2	5			
Kentucky.....	1	2	2	4	288,636	309,831	378,629
Tennessee.....	1	2	8	10			
Ohio.....	42	42	22	64	4,618,238	4,643,167	4,418,633
Illinois.....	15	17	9	26	1,836,875	1,819,813	1,840,038
Indiana.....	13	15	3	18			
Michigan.....	4	4	0	4	2,206,045	2,025,882	2,267,885
Wisconsin.....	1	1	4	5			
Minnesota.....	2	2	1	3	266,459	271,040	227,381
Missouri.....	0	0	2	2			
Colorado.....	3	3	2	5	310,185	298,649	344,027
Utah.....	1	1	0	1			
Total.....	191	186	115	237	19,602,376	18,932,161	19,117,018

HALF-YEARLY PRODUCTION OF CHARCOAL PIG IRON BY STATES.*

States.							
Alabama.....	1	0	2	2			
Tennessee.....	1	1	2	3			
Mississippi.....	0	0	1	1	77,361	86,519	85,052
Michigan.....	6	6	1	7			
Wisconsin.....	0	0	1	1			
Total.....	8	7	7	14	77,361	86,519	85,052

HALF-YEARLY PRODUCTION OF ALL KINDS OF FERRO-ALLOYS BY STATES.†

States.							
New York.....	0	0	0	0	64,250	65,494	64,776
New Jersey.....	0	0	0	0			
Pennsylvania.....	8	8	4	12	174,566	181,425	199,094
Maryland.....	0	0	0	0			
Virginia.....	1	0	1	1			
West Virginia.....	0	0	0	0	35,815	26,576	40,586
Tennessee.....	0	1	0	1			
Alabama.....	0	1	0	1			
Ohio.....	2	2	3	5			
Illinois.....	0	0	0	0	61,714	64,472	61,028
Iowa.....	0	0	0	0			
Total.....	11	12	8	20	336,345	337,967	365,484

HALF-YEARLY PRODUCTION OF PIG IRON AND FERRO-ALLOYS ACCORDING TO FUEL USED.

Coke pig iron.....	191	186	115	237	19,602,376	18,932,161	19,117,018
Charcoal pig iron.....	8	7	7	14	77,361	86,519	85,052
Total pig iron.....	199	193	158	351	19,679,737	19,018,680	19,202,070
Total ferro-alloys.....	11	12	8	20	336,345	337,967	365,484
Grand total.....	210	205	166	371	20,016,082	19,356,647	19,567,554

* Does not include the production of ferro-manganese, spiegeleisen, ferro-silicon, or other ferro-alloys.

† Includes 1 idle anthracite coal and coke furnace in Pennsylvania.

‡ Includes ferro-manganese, spiegeleisen, ferro-silicon, and other ferro-alloys made in blast furnaces or in electric furnaces.

* In the first six months of 1927 there were 16 blast furnaces in operation making ferro-alloys only or ferro-alloys and pig iron.

‡ Blast furnaces only; electric furnaces not included.

HALF-YEARLY OUTPUT OF PIG IRON BY GRADES AND FERRO-ALLOYS BY KINDS.

HALF-YEARLY PRODUCTION OF BASIC PIG IRON.

States.	First half of 1926.	Second half of 1926.	First half of 1927.
Massachusetts, New York.....	533,272	530,042	424,856
Pennsylvania—Allegheny County.....	2,051,375	1,826,930	1,795,268
Other counties.....	2,222,357	2,142,830	2,005,274
West Virginia, Alabama, Kentucky.....	911,818	1,012,037	1,087,654
Ohio.....	2,063,936	2,096,168	2,166,811
Indiana, Illinois.....	2,658,426	2,360,753	2,552,221
Michigan, Minnesota, Colorado, Utah.....	370,271	388,192	464,329
Total.....	10,811,455	10,356,952	10,496,413

HALF-YEARLY PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON

	1,951,994	1,910,224	1,961,151
Pennsylvania.....			
New York, Maryland, West Virginia, Tennessee, Alabama.....	633,835	562,272	670,219
Ohio.....	1,742,249	1,837,636	1,570,035
Indiana, Illinois, Wisconsin.....	655,474	748,640	792,317
Total.....	4,983,552	5,058,772	4,993,722
Including low-phosphorus pig iron.....	145,467	106,415	194,033

HALF-YEARLY PRODUCTION OF FOUNDRY PIG IRON.

	497,129	523,377	600,756
Massachusetts, New York.....			
Pennsylvania.....	533,089	380,578	486,879
New York, Maryland, West Virginia, Kentucky, Tenn.....	107,246	126,360	98,103
Alabama.....	683,659	642,794	630,087
Ohio.....	431,122	419,744	339,010
Illinois.....	223,594	196,397	234,234
Michigan.....	226,372	207,356	224,098
Wisconsin, Minnesota, Colorado, Utah.....	165,023	143,128	130,039
Total.....	2,867,234	2,639,734	2,743,206

HALF-YEARLY PRODUCTION OF MALLEABLE PIG IRON.

	117,747	104,358	130,174
New York.....			
Pennsylvania.....	54,457	68,277	41,009
Ohio.....	332,266	222,843	335,789
Illinois, Michigan, Wisconsin, Minn.....	368,804	413,145	337,096
Total.....	873,274	808,623	844,068

HALF-YEARLY PRODUCTION OF FORGE PIG IRON

	50,531	38,187	84,127
New York, Pennsylvania.....			
Virginia, Alabama, Ohio, Wisconsin.....	49,248	78,311	11,318
Total.....	99,779	116,498	95,445

HALF-YEARLY PRODUCTION OF MISCELLANEOUS GRADES OF PIG IRON AND DIRECT CASTINGS.

	2,624	1,810	2,327
New York, Pennsylvania.....			
Alabama.....	6,040	6,047	6,265
Ohio.....	12,631	5,070	6,988
Indiana, Illinois, Michigan, Wisconsin.....	23,148	25,174	13,636
Total.....	44,443	38,101	29,216

HALF-YEARLY PRODUCTION OF FERRO-ALLOYS BY KINDS.

	150,855	168,036	169,146
Ferro-manganese.....			
Spiegeleisen.....	41,890	34,325	53,314
Ferro-silicon.....	122,057	123,548	125,637
Ferro-phosphorus and all other ferro-alloys.....	21,543	12,058	17,387
Total.....	336,345	337,967	365,484

PIG IRON AND FERRO-ALLOYS MADE FOR SALE OR FOR USE OF MAKERS IN THE FIRST HALF OF 1927

Pig iron and ferro-alloys.	For sale.	For maker's use.	Total Gross tons.
Pig iron:			
Basic.....	881,574	9,614,839	10,496,413
Bessemer and low-phosphorus.....	314,294	4,679,428	4,993,722
Foundry.....	2,440,186	294,020	2,734,206
Malleable.....	815,025	29,043	844,068
Forge or mill.....	39,266	56,179	95,445
White and mottled, direct castings, etc.....	5,000	24,216	29,216
Total pig iron.....	4,504,345	14,697,725	19,202,070
Ferro-alloys:			
Ferro-manganese.....	57,576	111,570	169,146
Spiegeleisen.....	58,314		58,314
Ferro-silicon.....	125,637		125,637
All other ferro-alloys.....	17,344	43	17,387
Total ferro-alloys.....	253,871	111,613	365,484
Total pig iron and ferro-alloys.....	4,758,216	14,809,338	19,567,554

ent total is the sixth largest half year's output ever recorded, having been exceeded by both halves of 1916, the second half of 1918, the first half of 1923 and the first half of 1926.

Coke pig iron is reported at 19,117,018 tons, compared with 18,932,161 tons in the preceding half year and with 19,602,376 tons in the first half of 1926. Charcoal pig iron amounted to 85,052 tons, compared with 86,519 tons in the preceding half year and with 77,361 tons in the first half of 1926. Production of charcoal iron in the 12 months ended June 30, 1927, was smaller than the calendar year's production of char-

coal iron in any year since 1862, with the sole exception of 1921. Ferroalloys aggregated 365,484 tons, which is an increase over each half of 1926—the first half showing 336,345 tons and the second half 337,967 tons.

Of the total output of pig iron 14,697,725 tons, or 76.5 per cent, was made for the makers' own use. The remaining 4,504,345 tons was made for sale. Of the foundry pig iron, which totaled 2,743,206 tons, that made for sale amounted to 2,449,186 tons, or 89.3 per cent. About two-thirds of the ferromanganese production was made for the makers' own use. Practically all of the other ferroalloys, however, were made for sale.

River Shipments of Iron and Steel Rise Sharply

The river movement of iron and steel, as reported by the United States Engineers' office at Pittsburgh, increased sharply in July, totaling 124,507 net tons, or 47,868 tons more than in June, and reaching the highest mark for any one month since the use of the inland waterways for the shipment of iron and steel began to revive late in 1921. Incidentally, a new high annual record is probable, since the total shipments of iron and steel for the seven months ended July 31, as reported from the Pittsburgh district, have aggregated 557,018 tons, which compares with a total for all of 1926 of 315,221 tons and for 1925 of 377,403 tons. The total movement as reported from the Pittsburgh, Huntington, Cincinnati and Louisville districts for 1926 was 487,261 tons, and for 1925 it was 534,817 tons.

In the first seven months of this year the total tonnage of all commodities carried on the Ohio, Monongahela and Allegheny rivers within the district supervised by the United States Engineers' Pittsburgh office amounted to 20,523,767 tons, of which the movement of iron and steel represented 2.7 per cent. The detailed report of the Pittsburgh office for July, June, May and the seven months is shown, as follows, in net tons:

	July	June	May	Seven Months' Total
Coal	2,036,687	1,836,477	1,791,464	15,106,754
Coke	228,403	190,752	180,423	959,710
Gravel	347,199	352,514	294,783	1,687,061
Packet cargo...	5,452	4,494	5,193	30,823
Sand	495,928	435,334	309,099	1,994,164
Iron and steel.	124,507	76,639	92,384	557,018
Unclassified ...	21,069	33,301	25,249	188,237
Total	3,259,245	2,929,511	2,698,595	20,523,767

Sickness Among Industrial Employees

A study of diseases causing disabilities lasting more than a week was made by the Public Health Service of the United States Treasury Department and the result has been issued in a pamphlet entitled "Sickness Among Industrial Employees." The study covered 133,000 persons and showed annually 985 cases for each 10,000 persons. Influenza, including grip, represented the largest single cause of disease.

Iron and steel works showed a lower rate of disease than either public utilities or the general group of other industries studied. From 10,000 employees, the iron and steel figure was 769 cases of sickness against 1173 in public utilities and 976 in other industries, taken as a group. Women were more prone to sickness than men, the ratio being about 144 to 100. Based on 10,000 persons, the women showed 1364 cases of illness against 948 for the men.

Wholesale Prices Turn Upward

For the first time since last September wholesale prices of commodities, as reported by the United States Bureau of Labor Statistics, have turned upward. There was a steady drop from 150.5 in September to 143.7 in June. The figure for July is 144.6. This compares with 150.7 in July, 1926. Except for April, May and June of this year no monthly figure lower than the present has been recorded since April, 1922.

In spite of the rise in the general commodity figure, there was a decrease in that for metals and metal prod-

ucts, which dropped from 119.6 in June to 118.9 in July. It was 126.2 a year ago. The present figure is the lowest for metals since April, 1922, and is lower than that for any other group of commodities.

Farm products showed an increase in July of more than two points, while foods showed a drop of about one point. Both are close to the general average of all commodities. Clothing materials, which at 170.8 are the highest of all the large groups, increased more than one point, while building materials, in second position, declined nearly two points to 162.4.

Production of Iron and Steel in Canada

Canadian production of iron and steel in the first half of 1927 proceeded at a higher monthly rate than the average for 1926. The latter year was the highest, with the exception of 1923, since the post-war depression in 1921. It was, however, far below the capacity of Canadian plants. In fact, steel production was smaller than that of 1913, and was less than half the record figure established in 1918, of 1,622,000 tons of ingots. Totals from 1923 to the middle of 1927 are shown in the appended table, which was prepared by the iron and steel division of the United States Department of Commerce.

PRODUCTION OF IRON AND STEEL IN CANADA
(In gross tons)

Year	Pig iron	Ferro-alloys	Steel ingots	Steel castings
1923	880,018	28,961	839,710	45,060
1924	593,024	26,400	625,175	25,515
1925	570,397	25,709	733,855	18,840
1926	737,503	37,594	743,550	33,338
1927*	403,713	26,958	462,393	24,917

*Figures for the first six months only.

Decrease in Steel Barrel Production

Steel barrels manufactured during July by 28 companies are reported by the Department of Commerce at 578,223 units, with shipments of 576,602 barrels. Both figures are somewhat lower than those for June, but are about the same as the average for the first six months.

Unfilled orders at the end of July showed a sharp increase from June. The aggregate was for 1,346,688 barrels, of which 308,789 called for delivery within 30 days. The June total was 1,198,839 barrels, of which 232,468 called for delivery within 30 days.

Business of the Steel Barrel Manufacturers Institute in July is reported at \$1,050,681. The number of barrels shipped by members of the institute was 349,482, of which 129,010 went to New Jersey, with Pennsylvania and New York in second and third positions. No export shipments were reported. Capacity was used to the extent of 48.1 per cent, representing 23.5 per cent of capacity for I.C.C. barrels and 55 per cent of capacity for light barrels.

July shipments of electric industrial trucks and tractors is reported by the Department of Commerce at 90 units, compared with 140 in June and 111 in July a year ago. The total is the smallest since an equal figure was established in January. With that exception, it is the smallest in many months. Twelve tractors and 73 other types were included for domestic use, and five for export.

Machinery Markets and News of the Works

SALES VOLUME INCREASES

Machine Tool Business Turns Slightly Upward, Cincinnati Reports

Export Orders in August Exceed \$850,000 —
Automobile Company in Michigan Buys
25 Lathes

ALTHOUGH reports of machine tool buying do not uniformly show that August business is much ahead of July, the Cincinnati branch of the industry sees indications of a 10 or 15 per cent gain over last month. As a result, these machine tool companies are more optimistic than a few weeks ago regarding the outlook for fall buying, which probably will be stimulated somewhat by the many new tools to be shown at the National Machine Tool Exposition the week of Sept. 19, at Cleveland.

Export orders have been conspicuous in the past

week or two. Following the sale of 38 milling machines to a European automobile builder, mentioned a week ago, approximately 150 tools in all have been placed by this buyer in the United States, involving more than \$300,000. A Cincinnati builder will ship 10 lathes to England. Including South American business, export sales of a few companies in August exceed \$850,000.

A Detroit automobile company has ordered 25 lathes from a Cincinnati builder. Automobile companies as a whole, however, are doing very little buying.

The most noteworthy purchases by railroads are two 90-in. locomotive axle journal turning lathes, one each for the New York Central and Kansas City Southern. The Cincinnati Street Railway Co. is expected to place orders within the next two weeks for about \$100,000 worth of shop equipment.

An industrial company which a week or so ago bought seven radial drills has bought three more. The Detroit public schools have contracted for seven machines, millers and grinders. A Pennsylvania company is inquiring for five engine lathes.

New York

NEW YORK, Aug. 23.

MACHINE tool buying has not made any gains this month. The total amount of business in August, it is indicated, may not be much, if any, above that of July. The trade believes that the National Machine Tool Exposition in Cleveland next month may be the means of providing new buying interest that will give the machine tool industry considerably more business in fourth quarter than it is at present receiving. The New York Central Railroad and the Kansas City Southern have each placed an order with the Niles-Bement-Pond Co., New York, for a 90-in. locomotive axle journal turning lathe. A mining company, with office in New York, has bought a 62-in. vertical boring and turning mill.

The Anaconda Copper Mining Co., 25 Broadway, New York, has begun the construction of a new plant at its smelter at East Helena, Mont., for the treatment of molten smelter slag, including furnaces, combustion department, baghouse, etc. The plant will be of two-unit type, the second unit to be built later, and is reported to cost more than \$400,000 with equipment.

The Stieglitz Treiber Co., manufacturer of metal products, has removed its plant from 68 Thirty-third Street, Brooklyn, to a building on Borden Avenue, Long Island City, where increased production will be arranged.

Kleinert & Klie, 250 Park Avenue, New York, architects, are preparing plans for a two-story automobile service, repair and garage building at 333-47 Reid Avenue, Brooklyn, to cost about \$200,000 with equipment.

The Intertype Corporation, foot of Montague Street, Brooklyn, manufacturer of typesetting machines and parts, will have plans drawn by the Ballinger Co., Philadelphia, and 100 East Forty-second Street, New York, architect and engineer, for its new plant at Harrison, N. Y., to cost more than \$350,000 with equipment.

The Spencer-Wynne Paper Products, Inc., Newburgh, N. Y., Roy W. Spencer, 85 Grand Street, president, has awarded a general contract to the H. K. Ferguson Co., Cleveland, for its new mill, to be one story, 120 x 340 ft., to cost approximately \$100,000 with machinery. The company was organized recently with a capital of \$750,000.

George W. Swiller, 4215 Third Avenue, New York, architect, has plans under way for a new two-story automobile service, repair and garage building, to cost about \$150,000 with equipment.

The Johns-Manville Corporation, Madison Avenue and Forty-first Street, New York, manufacturer of fireproof building products, etc., will carry out expansion at four of its plants for the production of a new type of fireproof shingle, including the mills at Waukegan, Ill., Gretna, La., Pittsburg, Cal., and Nashua, N. H.

The Mercedes-Benz Co., New York, affiliated with the Mercedes America Co., Inc., 247 Park Avenue, New York, representative for the Mercedes automobile, has leased a new building on Honeywell Street, Long Island City, now in course of construction, for a new service and repair plant.

The Ruberoid Co., 95 Madison Avenue, New York, manufacturer of roofing products, is taking bids until Sept. 1 for a one and two-story addition to its plant at Bound Brook, N. J., to cost upward of \$50,000. Marshall Shoemaker, 15 Central Avenue, Newark, N. J., is architect.

The Board of Education, Passaic, N. J., is considering the installation of manual training equipment in a proposed new four-story high school to cost about \$350,000, for which plans will be drawn by Ernest Sibley, Passaic, N. J., architect.

The Hygienic Tube Co., 88 McWhorter Street, Newark, manufacturer of composition and other seamless tubing, etc., will soon break ground for a new one-story plant, 55 x 125 ft., to cost more than \$50,000 with equipment. Alfred Peter, 207 Market Street, is architect.

The John A. McCrane Motor Co., 638 Market Street, Paterson, N. J., is asking bids until Sept. 1 for a one-story service, repair and sales building, 100 x 300 ft., to cost about \$100,000 with equipment. A. E. Sleight, 138 Washington Street, is architect.

The Richard Chemical Works, 190 Warren Street, Jersey City, N. J., has plans maturing for a four-story factory, 100 x 250 ft., to cost about \$100,000 with equipment. E. M. Patterson, 76 Montgomery Street, is architect.

W. A. Birdsall & Co., 44 Mechanic Street, Newark, plumbing and heating equipment and supplies, has acquired about one acre at Linden, N. J., as a site for a new one and one-half story branch storage and distributing plant, with pipe-cutting, threading and other shop facilities, to cost upward of \$45,000 with equipment.

The Public Service Electric & Gas Co., Public Service Terminal, Newark, has plans nearing completion for a new

two-story equipment storage and distributing plant at Jersey City, with repair facilities, and service and garage building for company motor trucks, to cost about \$150,000 with equipment. The Public Service Production Co., an affiliated organization, address noted, is architect. The company will also build a one-story power substation on the Hackensack River, Jersey City, to cost close to \$50,000 with equipment.

The Scorchless Steam Pressing Iron Corporation, 566 Seventh Avenue, New York, has been organized to succeed the Standard Steam Iron Corporation in the manufacture of a high pressure steam heated iron for the cleaning, dyeing and garment trades. The iron will be manufactured under contract and present output has been arranged for.

Philadelphia

PHILADELPHIA, Aug. 22.

THE Central Construction & Supply Co., 2222 Arch Street, Philadelphia, manufacturer of refrigerating machinery and parts, will soon take bids for a new three-story plant, to cost in excess of \$85,000 with equipment. Poggi & Winters, Equitable Building, are architects. T. Shipley is president.

The Department of City Transit, 1211 Chestnut Street, Philadelphia, is asking bids until Aug. 30 for sump pumps and auxiliary power equipment for the Broad Street subway, contract No. 178. H. E. Ehlers is director.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, is securing permission for the construction of a steel tower transmission line from its new power plant, in course of erection at Conowingo, Md., to Philadelphia and vicinity. The company also plans the construction of a gaging station at Harrisburg, Pa., to be used in connection with the project. The entire development will cost in excess of \$40,000,000.

Philip S. Tyre, 114 South Fifteenth Street, Philadelphia, architect, has completed plans for a new two-story automobile service, repair and garage building, 50 x 225 ft., at Jenkintown, Pa., to cost about \$150,000 with equipment.

The Board of Education, Nineteenth Street, Philadelphia, has received a low bid from the McCloskey Co., 1620 Thompson Street, at \$909,730, for the erection of its proposed new trade and manual training school at Frankford Avenue and Clementine Street. The complete project, with equipment, will cost more than \$1,200,000. I. T. Catherine is architect for the board.

The Board of Works, City Hall, Philadelphia, George H. Biles, director, is asking bids until Sept. 1 for mechanical equipment, including intake screen house, Shawmont pumping station, contract 895; chlorine apparatus, Belmont mechanical filters, contract 893; steel doors for Shawmont pumping station, contract 898; breeching insulation, Queen Lane pumping station, contract 896.

Fleck Brothers, Inc., 50 North Fifth Street, Philadelphia, manufacturer of plumbing equipment and supplies, has acquired a three-story mill, on site 107 x 217 ft., and will remodel for a new factory branch and distributing plant.

The Board of Education, Lansdowne, Pa., plans the installation of manual training equipment in its proposed new senior and junior high school to cost \$450,000, for which superstructure will soon be placed under way. Heacock & Hokanson, 1211 Chestnut Street, Philadelphia, are architects.

J. B. Shoemaker's Sons, Front and East Clearfield Streets, Philadelphia, manufacturer of metal-reinforced and other wood boxes, cases, etc., has awarded a general contract to William F. Lotz, Frankford Avenue and Oxford Pike, for a two-story addition, 50 x 60 ft., to cost about \$40,000 with equipment.

John M. Melloy's Sons, 1419 Spring Garden Street, Philadelphia, manufacturer of tinware and kindred metal goods, has awarded a general contract to the Robert Lamb Co., 843 North Nineteenth Street, for rebuilding the portion of its four-story plant recently destroyed by fire, to cost close to \$30,000.

The Kieckhefer Container Co., Delair, N. J., manufacturer of corrugated and other paper containers and packages, has awarded a general contract to Irwin & Leighton, 126 North Twelfth Street, Philadelphia, for a two-story addition, 120 x 421 ft., to cost in excess of \$100,000 with machinery. Headquarters are at Sixteenth and Canal Streets, Milwaukee.

The Warren Mfg. Co., Milford, N. J., manufacturer of glassine and other processed papers, has approved plans for extensions and improvements in its mill, to provide about one-third additional floor space, with installation of considerable new machinery. The entire project will cost more than \$600,000.

The Department of Property and Supplies, Capitol Building, Harrisburg, Pa., B. E. Taylor, secretary, is asking bids until Sept. 27 for equipment and supplies for a period of six months, from Oct. 15, 1927, to April 15, 1928, including labor-

atory and engineering supplies, schedule K; hardware supplies, schedule M; and electrical, heating and plumbing supplies, schedule O.

The Sayre School District, Sayre, Pa., plans the installation of manual training equipment in a proposed two-story high school, to cost \$475,000, for which bids will be asked on a general contract early in September. Randall & Vedder, A. & K. Building, Syracuse, N. Y., are architects; H. C. Child, 501 South Keystone Avenue, Sayre, is associate architect; A. R. Ackeson, Eckel Building, Syracuse, is mechanical engineer.

The Pennsylvania Water & Power Co., Holtwood, Pa., has taken over the Holtwood Power Co., with local steam-operated electric generating plant. Plans are under consideration for enlargement in the steam power station, with equipment to increase the capacity from 30,000 hp. to more than 100,000 hp. The Pennsylvania company is controlled by the Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore.

The receiver for the Kuebler Foundries, Inc., Easton, Pa., will arrange for an early public sale of the plant and property. The bankruptcy court has refused to confirm a recent tentative sale of the property at a price of \$60,000. Appraisers for the referee in bankruptcy have placed a value of \$216,000 on the plant and equipment.

The Pennsylvania Railroad Co., Philadelphia, is considering the erection of a new car repair shop at its Todds Cut repair works, Wilmington, Del., to handle electric rolling stock and equipment used on the Wilmington and West Chester branches of the railroad, which are now being electrified. It is scheduled for completion early in 1928, and will cost in excess of \$250,000 with machinery.

New England

BOSTON, Aug. 22.

ACCORDING to a majority of machine tool dealers the past week has been one of the quietest this year. To add to this several New England machine tool manufacturing plants were closed for inventory purposes. Purchases the past week included a 16-in. x 7-ft. lathe, four 12-in. x 4-ft. lathes, a Blount wet tool grinder, a drill press, a plain drill press, a power hack saw, a furnace, a German made punch and shear and several vises for schools for the city of Boston; a used four spindle drill and a foot press for a Cambridge plant; a rebuilt screw machine for a Southbridge, Mass., optical company, and a 28-in. gap lathe and a shaper for the Lawrence Paper Co., Lawrence, Mass.

Small tools are selling in much greater proportion than machine tools, but business is far from active.

The United Shoe Machinery Corporation, Beverly, Mass., in ordering parts of machine tools where some doubt might exist as to just what is wanted and in cases where it is difficult to describe what is wanted by letter, includes in its order for such parts the serial number of the machine tool, the make and a photograph of the part wanted. No measurements are given. It is the only company in New England taking this method to identify parts.

Albert Kahn, 1000 Marquette Building, Detroit, architect, is taking bids for a two-story sales and service building for the General Motors Corporation, on Beacon and Arthur Streets, Boston.

The Manton-Gaulin Mfg. Co., 11 Elkins Street, Boston, manufacturer of dairy machinery, etc., has awarded a general contract to J. M. Swan & Co., St. Johnsbury, Vt., for a new one and two-story plant at St. Johnsbury, to cost upward of \$150,000 with equipment.

Under the direction of the Chamber of Commerce, Westfield, Mass., a municipal airport, known as the Barnes landing field, is being established on a tract of about 50 acres. Plans include the construction of a group of hangars, with machine and repair shops, oil buildings, etc.

Peter Mono, New London, Conn., operating a heating and plumbing equipment works, has filed plans for a one-story machine shop, 45 x 74 ft., with department for pipe-cutting, threading, etc.

The Union Electric Light & Power Co., Unionville, Conn., is arranging for a bond issue of \$10,000,000, a portion of the proceeds to be used for expansion and improvements in power plants and system. E. H. Deming is president.

The Board of Works, New Bedford, Mass., is completing plans for the early construction of a one-story municipal machine and repair shop to cost about \$55,000. L. L. Brode, 888 Purchase Street, is architect.

The Crane Market

SLIGHTLY more activity has been shown in the market for electric overhead cranes during the past few days. Three Eastern railroads are reported to have made purchases and other miscellaneous business has been closed. Business in locomotive cranes has not improved. One large inquiry which has been before the market for a long time will probably be placed in the next week. New inquiries for both overhead and locomotive units are rather scarce. The Watsontown Door & Sash Co., Watsontown, Pa., expects to buy a used 5 to 7½ ton, 60 to 70 ft. span, 3-motor, overhead crane.

Among recent purchases are:

Central Railroad of New Jersey, a drop table and locomotive hoist for its Bethlehem, Pa., terminal, from the Whiting Corporation.

New York Central Railroad, reported to have purchased two 10-ton gantry cranes, one for Syracuse and the other for Rochester, N. Y., from the McMyler-Interstate Co.

Erie Railroad, reported to have bought a 15-ton electric overhead crane for Hornell, N. Y., from a Western builder.

West Virginia Pulp & Paper Co., 200 Fifth Avenue, New York, a 4-ton, 44-ft. span, overhead electric crane for its Covington, W. Va., mill, from the Shaw Crane Works.

Brooklyn Foundry Co., Inc., Astoria, L. I., a 3-ton, 3-motor, electric overhead crane, 22½-ft. span, from the Shepard Electric Crane & Hoist Co.

Otis Steel Co., Cleveland, a 200-ton ladle crane from the Morgan Engineering Co.

The Anderson Woodworking Co., Burnside, near Hartford, Conn., is being reorganized preparatory to the adoption of a general expansion program, to include the installation of considerable new equipment.

The Worthington Pump & Machinery Corporation, 37 Appleton Street, Holyoke, Mass., has work in progress on a one-story addition to the machine and erecting shops at its local plant, to cost more than \$70,000 with other expansion. General contract was let recently to the Casper Ranger Construction Co., 20 Bond Street. Headquarters are at 115 Broadway, New York.

The American Fastener Co., Inc., Waterbury, Conn., manufacturer of snap fasteners, etc., is completing plans for a five-story addition reported to cost more than \$85,000. C. Jerome Bailey, Waterbury, is architect.

son Co., Times-Dispatch Building, architect. The same architect has plans under way for a new junior high school in the East End district, in which manual training equipment, also, is planned, to cost more than \$400,000.

The Bernhardt Furniture Co., Lenoir, N. C., has awarded a general contract to the Poe-Triplett Construction Co., Lenoir, for rebuilding the portion of its factory recently destroyed by fire, to cost upward of \$40,000 with equipment.

The Greenville Spindle & Flyer Co., Camp Sevier, Greenville, S. C., manufacturer of textile equipment, is planning the early rebuilding of the portion of its mill recently destroyed by fire, with loss reported in excess of \$35,000 with machinery.

South Atlantic States

BALTIMORE, Aug. 22.

THE Maryland Meter Works, 309 East Saratoga Street, Baltimore, has revised plans under way for a new six-story plant, to cost close to \$250,000 with equipment. Theodore W. Pietsch, American Building, is architect.

H. P. Willmir, 3815 Juniper Road, Guilford, Baltimore, has inquiries for equipment for the manufacture of excelsior.

The City Council, Milford, Del., is planning extensions and improvements in the municipal electric light and power plant, including the installation of a new turbine engine unit and accessory equipment, to cost \$30,000.

The Standard Face Brick Corporation, Staunton, Va., has approved plans for a new unit for the production of hollow tile and kindred products, to have a capacity of 50,000 pieces per day. A division of the plant will be given over to the production of face brick. The entire project is reported to cost in excess of \$70,000 with machinery. F. J. Ellsworth, 316 Vine Street, is secretary, in charge.

Travis & Brother, Inc., Waverly, Va., is considering the construction of a one-story ice-manufacturing plant at Hopewell, Va., with initial capacity of 40 tons per day, to cost about \$65,000 with machinery.

Lee G. Morganroth, Farmers' Bank Building, Pittsburgh, engineer for the Harbison-Walker Refractories Co., same address, is said to have plans under way for the initial unit of its proposed new firebrick and refractory plant at Brooklyn, Baltimore, to cost upward of \$500,000 with equipment.

The John Smith-Chevrolet Co., 190 West Peachtree Street, Atlanta, Ga., local representative for the Chevrolet automobile, has plans under way for a new one-story and basement service, repair and garage building, to cost \$75,000 with equipment. Lockwood, Greene & Co., Healy Building, are architects and engineers.

The Edward P. Phillips Machinery Co., Mutual Building, Richmond, Va., has inquiries out for a portable boiler, locomotive type, 75-hp. capacity, to operate at 150 lb.

The Summers Fertilizer Co., Stock Exchange Building, Baltimore, will soon begin the erection of a new plant unit, one story, 60 x 160 ft., to cost in excess of \$65,000 including equipment.

The Baltimore City School Board, Madison and Lafayette Streets, Baltimore, is planning a call for bids about Sept. 1 for a proposed three-story repair shop, equipment storage and distributing warehouse, to cost in excess of \$70,000 with equipment. William F. Stone, Munsey Building, is architect; Henry Adams, Calvert Building, is engineer.

The Richmond School Board, Richmond, Va., contemplates the installation of manual training equipment in its proposed new Western high school to cost close to \$500,000, for which plans are being prepared by the Charles M. Robin-

Buffalo

BUFFALO, Aug. 22.

PLANs are being considered by the General Drop Forge Co., 1738 Elmwood Avenue, Buffalo, for a one-story addition, to cost in excess of \$45,000 with equipment. Ernest McGeorge, 3030 Euclid Avenue, Chicago, is architect and engineer.

Officials of the Mohawk-Hudson Power Corporation, Syracuse, N. Y., operating the Syracuse Lighting Co., Seneca River Power Co., Utica Gas & Electric Co., and other light and power properties, are organizing the New York Power & Light Corporation, to take over and consolidate the Adirondack Power & Light Co., Schenectady; Municipal Gas Co., Albany; Troy Gas Co., Troy; Fulton County Gas & Electric Corporation, Gloversville; Adirondack Electric Power Corporation, Schenectady, and the Cohoes Power & Light Corporation, Cohoes. The combined assets of the companies to be merged aggregate \$100,000,000. The new company has asked permission to issue \$70,000,000 in bonds, \$18,000,000 in preferred stock, and 1,250,000 shares of common stock, no par value, the proceeds to be used to perfect the consolidation, and for proposed expansion. Charles S. Ruffner is president of the Mohawk-Hudson organization.

The Beacon Oil Co., 38 Beecham Street, Everett, Mass., is planning the construction of a new one-story oil storage and distributing plant at Utica, N. Y., to cost more than \$65,000 with equipment. A service, repair and garage building will be erected for company motor trucks.

The West Seneca School Board, West Seneca, N. Y., is said to be planning the installation of manual training equipment in a three-story addition to the high school to cost about \$140,000, for which plans are being drawn by Hudson & Hudson, Dun Building, Buffalo, architects.

The Loblaw Groceries, Inc., 166 Chandler Street, Buffalo, plans the installation of ovens, conveying and other equipment in connection with an addition to its factory and warehouse; a refrigerating plant will also be installed. A portion of the new structure will be equipped as a wood-working division, for the production of store equipment, shelving, etc., used in retail grocery stores operated by the company. The entire project will cost close to \$200,000. L. H. Pedler is vice-president, in charge of operations.

The Board of Education, Johnson City, N. Y., plans the installation of manual training equipment in a proposed high school addition to cost approximately \$500,000, for which bids have been asked on a general contract. Edward Vosbury, Binghamton, N. Y., is architect.

The Coplan Steel Corporation, Ogdensburg, N. Y., whose plant was listed for public sale on account of unpaid taxes, as stated in THE IRON AGE of July 28, advises that while it is true that a description of the plant had been turned in to the county treasurer by the supervisor of the town of Oswegatchie, this was due to a misunderstanding as to payment of taxes, and the matter has now been straightened out. The plant has been temporarily leased to the Economy Metal

Products Corporation, and it is expected that it will be under at least partial operation in a short time. The Economy Metal Products Corporation and the Coplan Steel Corporation are affiliated companies having joint office at 30 Church Street, New York. They specialize in steel castings, chrome forged balls, grate bars for locomotives and steamships and hot blast cupolas.

Pittsburgh

PITTSBURGH, Aug. 22.

MACHINE tool business still consists of a steady flow of parts and small machine orders, but only occasional sales of tools that total large from a monetary standpoint. The list of the Westinghouse Electric & Mfg. Co. is the only important one before the trade. That company has placed a few orders, but most of the items on which prices were asked have yet to be bought. Some dealers look for better business with the ending of the vacation period, but others expect little until after the machine tool exhibition in Cleveland during the week of Sept. 19.

The American Cotter Pin Co., Ellwood City, Pa., is reported planning a one-story addition to cost more than \$40,000 with equipment. It is understood that the project will mature after the first of the year.

Hubbard & Co., 6301 Butler Street, Pittsburgh, manufacturers of hardware products, have taken out a permit for a one-story addition.

The Penn Machine Co., Station Street, Johnstown, Pa., has awarded a general contract to the Wilson Construction Co., Johnstown Trust Building, for a two-story addition, 40 x 120 ft., to cost about \$45,000.

The Hillman Coal Co., Fayette City, near Washington, Pa., is said to be planning to rebuild the portion of its tipples destroyed by fire Aug. 18, with loss reported in excess of \$35,000 including equipment.

The Guyan Machine Shops, Logan, W. Va., machinery dealers, have inquiries out for steel or cast iron gears and pinions, with cut or cast teeth, the gears being from 24 to 48 in. in diameter.

The United States Engineer, Huntington, W. Va., is asking bids until Aug. 31 for steel boiler tubes, circular 34; until Aug. 30 for two, three or four outboard gasoline motors, with magneto or battery ignition; until Aug. 29, for sand blast hose, and six sand blast operators' hoods.

The Borough Council, Grove City, Pa., is asking bids until Sept. 6 for mechanical equipment for a filtration and water-softening plant, hydraulic or hand-operated. Hudson & Myron, Wabash Building, Pittsburgh, are engineers.

The Edgewater Steel Co., Oakmont, Pa., has secured adjoining property totaling 28 acres, and is reported planning to use a portion of the site for expansion.

The Associated Gas & Electric Co., 61 Broadway, New York, is planning for enlargements in two of its hydroelectric generating plants operated by the Associated Pennsylvania Properties, Inc., an affiliated organization, located in the Pliny and Deep Creek sections. Each plant has a capacity of 24,000 hp. and this will be increased to 36,000 hp., in both instances, before the close of the year.

The Westinghouse Air Brake Co., Wilmerding Pa., has arranged for an increase in capital from 1,000,000 shares of stock, \$50 par value, to 4,000,000 shares of stock, no par value, a portion of the proceeds to be used for general expansion.

Detroit

DETROIT, Aug. 22.

OVENS, power equipment, conveying and other machinery will be installed in the addition to be erected to the plant of the Michigan Biscuit Co., Muskegon, Mich., comprising the former works of the Hasper Biscuit Co., recently acquired, designed to double the present capacity. It will cost close to \$100,000. Frank S. Forster, Muskegon, is architect.

The St. Joseph Board & Paper Co., St. Joseph, Mich., recently organized with a capital of \$100,000, has taken over the local Mid-Lakes Paper Mill, heretofore operated by Mullin Brothers, and will operate for the production of paper and paper-board products. The new owner is said to be planning extensions and betterments. The purchasing company is headed by Kirk Sutherland, St. Joseph, and Claude E. Nicely, South Bend, Ind.

The Detroit Edison Co., 2000 Second Avenue, Detroit, is said to be planning the construction of a one-story equipment storage and distributing plant, with repair facilities,

at Six Mile and Connors Roads, Mount Olivet section, to cost about \$125,000 with equipment.

The Alert Pipe & Supply Co., Bay City, Mich., has work nearing completion on a new storage and distributing plant, with pipe-cutting, threading and other facilities, totaling 24,000 sq. ft. of floor space. Other expansion will be carried out at an early date.

The City Council, Grand Haven, Mich., will make extensions and improvements in the municipal electric light and power plant to cost about \$30,000 with equipment.

The Owosso Casket Co., Owosso, Mich., has plans under way for a new two-story factory branch and distributing plant at Detroit, to cost in excess of \$50,000. Weston & Ellington, Stroh Building, Detroit, are architects and engineers. Fred B. Woodward is president.

The Richard Brothers Die Works, 1560 East Milwaukee Street, Detroit, will soon proceed with the erection of an addition, reported to cost close to \$45,000 with equipment. J. L. Miller, Cadillac Square, is architect.

The Utilities Engineering Co., Muskegon, Mich., has begun the erection of a new plant to cost close to \$30,000 with equipment.

The H. S. Lee Foundry & Machine Co., Plymouth, Mich., is building an addition to provide 2800 additional sq. ft. of floor space.

Chicago

CHICAGO, Aug. 22.

SALES of machine tools are widely scattered and new inquiry gives no promise of a more active market which is fully 20 per cent less in actual orders than a year ago at this time. Used tools which are in good condition are in fair demand and small tools are selling well.

The International Harvester Co. has purchased three 32-in. and a 24-in. shaper for its Chicago plants and is asking for prices on several items for shipment to Moline, Ill. A tractor builder at Waterloo, Iowa, is still in the market and reports indicate that the J. I. Case Threshing Machine Co., Racine, Wis., will soon issue a list. The list for the Lane Technical High School is being prepared and several automobile parts manufacturers are contemplating the purchase of machine tools. Railroad business is confined to odd tools still pending from inquiry made earlier in the year.

The City Council, Woodstock, Ill., is planning to spend \$30,000 for extensions and betterments in the municipal electric light and power plant. R. C. Wood, is city clerk.

The Morrissey Foundry, 308 West Roberts Street, Crookston, Minn., has been purchased by J. E. Lappen. F. H. Morrissey, formerly manager of the foundry, has retired from active management. There will be no change in the operation of the foundry at present.

Contract has been let by the Battery Equipment & Supply Co., 1640 South Wabash Avenue, Chicago, to the Person Construction Co., 1551 East Seventy-fifth Street, for a new one and two-story plant to cost in excess of \$100,000 with equipment. A. A. Schwartz, 720 North Michigan Avenue, is architect.

The Chicago Coated Board Division or the Robert Gair Co., 420 East North Water Street, Chicago, has taken out a permit for a two-story addition, 175 x 200 ft., to its machine department, to cost \$200,000 with equipment. Headquarters of the parent company are at 350 Madison Avenue, New York.

The Borg-Greenleaf Corporation, 4450 Ravenswood Avenue, Chicago, manufacturer of electric clocks for automobiles, has leased space in the building at 451-69 East Ohio Street, totaling more than 17,000 sq. ft. of floor space for expansion.

The Creamery Package Mfg. Co., 61 West Kinzie Street, Chicago, manufacturer of dairy machinery, cream separators, etc., is said to be planning the early rebuilding of the portion of its plant at Owatonna, Minn., destroyed by fire Aug. 11, with loss reported in excess of \$85,000 including equipment.

The Pure Oil Co., 35 East Wacker Drive, Chicago, operating oil refineries in several states, has arranged for a preferred stock issue of \$5,000,000, a portion of the proceeds to be used for expansion.

The Board of Education, 650 South Clark Street, Chicago, contemplates the installation of manual training equipment in its proposed three-story junior high school at Sacramento and Polk Streets to cost \$1,500,000, for which bids have been asked on a general contract. J. O. Christensen, 650 Clark Street, is architect. J. E. Byrnes is business manager.

The Corona Pen Co., 611 Milwaukee Street, Janesville, Wis., has begun the erection of a new plant at Antioch, Ill., 50 x 100 ft., to cost more than \$65,000 with equipment.

The Hall Hardware Co., 608 Third Street, North, Minneapolis, Minn., will ask bids early in September on a general contract for a proposed multi-story storage and distributing plant to cost close to \$100,000 with equipment. Bertrand & Chamberlin, Northwestern Bank Building, are architects.

The Northern Pacific Railway Co., Railroad Building, St. Paul, Minn., has plans maturing for a new engine house with repair facilities at Glendive, Mont., to cost more than \$45,000. O. M. Rognan is company architect.

The Koro Corporation, 229 West Illinois Street, Chicago, formerly known as the Lincoln Steel Co., has acquired property in the terminal district, Waukegan, Ill., and will establish a new plant for the manufacture of welding equipment, electrodes, etc., to cost upward of \$35,000. It is purposed to remove the Chicago works to the new location.

The Common Council, Greybull, Wyo., plans the installation of pumping machinery and power equipment in connection with proposed extensions in the municipal waterworks, for which a fund of \$225,000 is being arranged.

Cincinnati

CINCINNATI, Aug. 22.

SALES turned upward the past week, and indications are that bookings in August will exceed those of July by 10 to 15 per cent. Inquiries are increasing with the result that machine tool manufacturers are much more optimistic than a few weeks ago about the outlook for fall business. One local builder reports that in volume of sales August is the best month since 1917. The market continues spotty, some companies having received sizable orders and others having sold only a few single machines. In response to the betterment of conditions a few plants have increased operating schedules, but this is not general.

A Cincinnati machine tool company has received a large order for lathes from a European buyer. An automobile company in the Detroit district has purchased 25 lathes from a local builder. The Cincinnati Street Railway Co. is expected in the next two weeks to close against its list of tools for its new repair shops, the total expenditure to be about \$100,000. A local manufacturer has sold three more radial drills to the company which a week ago purchased seven, the entire order amounting to 10. The Detroit public schools have contracted for seven milling machines and grinders, while a Pennsylvania company is inquiring for five 24-in. engine lathes. The Anaconda Copper Mining Co. has bought a 62-in. boring mill, and the Western Gas Construction Co., Fort Wayne, Ind., a 96-in. x 72-in. x 12-ft. planer. The New York Central and the Kansas City Southern each has taken a 90-in. locomotive journal turning lathe. A local builder has booked an order for 10 lathes for delivery to England.

The Herron Stove & Foundry Co., Chattanooga, Tenn., has been organized to manufacture stove plate and light gray iron castings for the stove making industry. It has begun operations in the former plant of the Southern Foundry & Machine Co. and plans some additions. F. T. Herron is president and general manager.

Plans have been filed by the Columbus Merchants' Garage Co., 98 North Front Street, Columbus, Ohio, W. T. Thompson, president, for a six-story service, repair and garage building, 125 x 190 ft., to cost upward of \$500,000 with equipment.

The L. J. Breed Equipment Co., James Building, Chattanooga, Tenn., machinery dealer, has inquiries out for a planer, 72-in. bed, about 5-ft. rise on cross rail.

The Kingsport Foundries, Inc., Kingsport, Tenn., recently organized, has acquired property totaling more than three acres and plans the early erection of a one-story foundry and machine shop to cost close to \$40,000 with equipment. W. E. Ring and J. G. Vaughn, Kingsport, head the company.

The Board of Education, Plymouth, Ohio, is reported planning the installation of manual training equipment in a proposed new high and grade school to cost \$190,000, for which Walker and Norwich, Third and Main Streets, Dayton, Ohio, architects, will prepare plans.

The Moeschl-Edwards Corrugating Co., Covington, Ky., manufacturer of corrugated metal culverts and other corrugated iron products, has plans for a one-story plant to cost about \$21,000 with equipment. B. T. Wisenail, Covington, is architect.

The Joseph Papania Co., 244 Vine Street, Lexington, Ky.,

has completed plans for a new three-story cold storage and refrigerating plant to cost close to \$100,000 with machinery. Frankel & Curtis, Hernando Building, are architects.

The Air Corps, Material Division, Wright Field, Dayton, Ohio, is asking bids until Sept. 6 for 800 fuel pumps and 100 hand fuel pumps, with fuel cocks, strainers, etc., circular 63.

Cleveland

CLEVELAND, Aug. 22.

MACHINE tool sales are light and August is not expected to show up quite as well as July in the aggregate volume of business. However, a local manufacturer of turret lathes reports a gain in orders over the corresponding period last month, having taken some single tool business in large machines. Machinery buyers are showing considerable interest in the coming National Machine Tool Exposition in Cleveland and it is believed that some business is being held back until that exhibit. With very little buying by the automotive industry the Detroit market continues dull.

The Superior Screw & Bolt Co., Aetna Road and East Ninety-third Street, Cleveland, will erect an addition, 100 x 107 ft., of brick, steel and concrete.

The Bronze Foundry & Machine Co., 4007 Detroit Avenue, Cleveland, is erecting a one-story addition, 50 x 60 ft.

The Gravity Timing Devices Co., Cleveland, has been organized to lease and grant manufacturing rights under its own patents of several mechanical timing devices and gravity controlled locking devices applicable to office safes and smaller containers. The company does not expect to manufacture at the present time. H. H. Griswold, 1723 Engineers Bank Building, Cleveland, is the attorney.

The Midland Steel Products Co., Madison Avenue and West 106th Street, Cleveland, manufacturer of automobile frames, etc., has begun the erection of an addition to cost approximately \$100,000, with equipment. E. J. Kulas is president.

The General Motors Corporation, Detroit, has asked bids on a general contract for a new four-story service, repair and sales building, with parts department, etc., at Toledo, Ohio, to cost about \$300,000 with equipment. H. G. Hickey is in charge.

The Chamber of Commerce, Findlay, Ohio, is at the head of a project to construct a municipal airport, to include hangars, machine and repair shops, oil buildings, etc., to cost in excess of \$90,000. A bond issue will be arranged soon.

The Mellick Oil Co., Crooksville, Ohio, W. Mellick, president, is reported planning the construction of a new oil refinery to cost more than \$200,000 with machinery.

The Ohio Public Service Co., Hanna Building, Cleveland, is completing plans for a new one-story equipment storage and distributing plant, with repair facilities, at Elyria, Ohio, to cost close to \$80,000 with equipment.

The Draper Mfg. Co., Crane Avenue and East Ninety-first Street, Cleveland, manufacturer of steel barrels, drums, etc., is said to be contemplating enlargements in its plant.

The Cleveland Railway Co., Hanna Building, Cleveland, has plans under way for a new service, repair and garage building for company buses, to cost approximately \$200,000 with equipment. Wilbur Watson & Associates, 4614 Prospect Avenue, are architects and engineers.

St. Louis

ST. LOUIS, Aug. 22.

BIDS will be received by the Board of Public Service, St. Louis, O. D. Tillay, secretary, until Sept. 6 for one gasoline-operated full revolving crawler crane, with complete auxiliary equipment, for service at the Missouri River plant of the St. Louis waterworks. (Estimated cost \$98,000). Leonard A. Day is water commissioner.

The Ozark Utilities Co., Pleasant Hill, Mo., J. K. Green, president, will begin the construction of a new hydroelectric generating plant in the vicinity of Osceola, Mo., to cost more than \$200,000 with equipment. A transmission line will be built.

The Electric Committee of the City Council, Ralph Pedrick, chairman, Little Rock, Ark., is planning the installation of new automatic electric equipment at the municipal power station, including switchboard and accessories.

The Carter Carburetor Corporation, 2840 North Spring Street, St. Louis, has plans for a new one and two-story and basement plant, 30 x 45 ft., to cost about \$23,000 with

equipment. William P. McMahon, Buder Building, is architect.

The Seaman-Dunning Corporation, West Fourth Street, Pine Bluff, Ark., manufacturer of automobile bodies, has awarded a general contract to the E. Charles Royse Co., Citizens National Bank Building, for an addition, 200 x 215 ft., to double the present output of 400 bodies per day. Six new kilns will be built, each with capacity of 63,000 ft. The machinery installation will cost in excess of \$150,000 and the entire project is expected to cost approximately twice that sum. C. A. Dunning is general manager.

The City Council, Chelsea, Okla., plans the installation of a 75,000-gal. steel tank, on 100-ft. steel tower, with power equipment, pumping apparatus, etc., in connection with proposed extensions and improvements in the municipal waterworks and sewage system. The complete project will cost \$150,000. The Benham Engineering Co., Gumbel Building, is engineer.

The Board of Education, Wellington, Kan., plans the installation of manual training equipment in a proposed two-story high school to cost \$250,000, for which plans are being drawn by Schmidt, Boucher & Overend, National Bank Building, Wichita, Kan., architects.

The Southern Ice Co., St. Louis, is said to be planning the construction of a new ice-manufacturing plant at Little Rock, Ark., to cost approximately \$150,000 including machinery.

The Peake Auto Supply Co., 310 East Sixteenth Street, Kansas City, Mo., will soon take bids on a general contract for a new three-story and basement, 75 x 85 ft., addition, for service, repair and parts departments, to cost more than \$80,000. A one-story top addition will be built also to the present two-story plant.

The F. H. McLain Co., University Place, Lincoln, Neb., has been organized to succeed the Victory Mfg. Co., in the manufacture of machinery and parts, particularly lawn mowers. The company expects to erect and equip a plant in the near future and will be in the market for materials and equipment.

Indiana

INDIANAPOLIS, Aug. 22.

THE H. & P. Electric Co., Bloomington, Ind., will soon take bids on a general contract for a new two-story plant to cost about \$55,000 with equipment. H. E. Boyle, Furniture Building, Evansville, Ind., is architect and engineer.

The Keen Foundry Co., Griffith, Ind., will soon begin the erection of a new one-story foundry, to cost \$25,000 with equipment.

The Roy Wilmet Co., 720 North Meridian Street, Indianapolis, automobile dealer, has awarded a general contract to the William P. Jungclaus Co., 825 Massachusetts Avenue, for a two-story and basement service, repair and garage building, 77 x 205 ft., to cost \$100,000. Rubush & Hunter, American Central Life Building, are architects.

The Maring Wire Co., Muskegon, Mich., manufacturer of magnet wire and other wire products, has awarded a general contract to the Ethelman Co., 714 Jackson Street, Anderson, Ind., for its new one-story plant, 110 x 250 ft., at Anderson, to cost about \$45,000 with equipment.

The Board of School Commissioners, Indianapolis, will install manual training equipment in the addition to be erected at the Technical High School on East Michigan Street, consisting of two three-story extensions, to cost \$250,000. Vonnegut, Bohn & Mueller, Indiana Trust Building, are architects.

The Delco-Remy Division of the General Motors Corporation, Anderson, Ind., has secured patent rights from the Blossom Lock Co., Cleveland, for the manufacture of a combination ignition and transmission lock for automobiles. Arrangements will be made for the manufacture of the new equipment at the Anderson works, where a department will be established.

The Udylyte Process Co., Kokomo, Ind., has been acquired by Fred J. Fisher, Detroit, and interests connected with the Union Carbide & Carbon Corporation, 30 East Forty-second Street, New York, and the management in the future will be under the direction of the General Chromium Co., 3220 Bellevue Avenue, Detroit. M. E. Louth, general manager, operated under the direction of the Union Carbide organization. The Kokomo works will be continued in service as heretofore, and expansion in output is planned.

The Board of Education, Lafayette, Ind., contemplates the installation of manual training equipment in a proposed two-story addition at the Jefferson High School, to cost \$350,000, for which bids are expected to be asked on a general contract early in September. Walter Scholer, Painters' and Decorators' Building, is architect; R. W. Noland, Lafayette Life Building, is mechanical engineer.

The Arco Battery & Plate Co., 207 East Columbia Street, Fort Wayne, has been incorporated with a capital of \$25,000 to manufacture batteries, battery plates and various electric units for radio sets. The company has factories at 825 Barr Street, Fort Wayne, and at 1727 Sedgwick Street, Chicago.

The F. & N. Lawn Mower Co., Richmond, Ind., advises THE IRON AGE that exaggerated reports have gone out concerning a fire which occurred in one of its buildings on Aug. 2. The company states that the damage was insignificant and that the entire plant continued in production without losing a single day's time. The only damage was that done to two or three pieces of machinery which have been repaired and are again in operation.

Gulf States

BIRMINGHAM, Aug. 22.

CONTRACT has been let by the Olmstead Motor Co., 802 Laura Street, Jacksonville, Fla., to R. J. Gillespie, Baldwin Building, for a new four-story service, repair and garage building, to cost more than \$100,000 with equipment. Marsh & Saxelby, Jacksonville, are architects.

The Alabama Power Co., Birmingham, has secured permission for the construction of a hydroelectric generating plant at lock 17, Warrior River, to be equipped for a capacity of 20,000 kw. The project will include the construction of a transmission line to Tuscaloosa, Ala., and the electrification of the lock, and is estimated to cost in excess of \$1,000,000.

The Prest-O-Lite Co., 30 East Forty-second Street, New York, manufacturer of acetylene welding equipment, etc., is reported to have plans under way for a new plant on site recently acquired at Dallas, Tex., comprising a three-story and two-story unit, to cost upward of \$125,000 with equipment.

The Sewage and Water Board, City Hall, New Orleans, has approved an appropriation of \$290,000 for the installation of additional equipment in the power department of the municipal waterworks, to include boilers, coal pulverizers, air preheaters, draft fans, etc.

The Stevenson Engineering Co., Fort Worth National Bank Building, Fort Worth, Tex., is arranging for the purchase of a site in the business district at Dallas, Tex., for a central refrigerating and cold storage plant, with facilities in the refrigerating department to serve hotels and other buildings as a central station. The project is expected to cost in excess of \$600,000 with machinery. F. O. Stevenson is president.

The West Texas Gas Co., Amarillo, Tex., a subsidiary of the Prairie Oil & Gas Co., Independence, Kan., is planning the construction of a new pipe line from Lubbock to Midland, Tex., using 10 3/4-in. diameter, welded pipe, with other extensions in this section for natural gas transmission. A compressor plant will be built near Plainview, Tex. The entire project will cost in excess of \$5,000,000 with equipment.

The McWane Cast Iron Pipe Co., 3600 Eleventh Avenue, Birmingham, is said to be planning enlargements to double, approximately, the present capacity, with the installation of additional equipment. The company has recently increased its capital from \$500,000 to \$1,000,000, a portion of the proceeds to be used for expansion.

G. C. Ehemann & Co., Memphis, Tenn., have tentative plans under way for the construction of a new hardwood mill in the vicinity of Mount Pleasant, Tex., to cost in excess of \$65,000 with equipment.

The Birmingham National Garage Co., Inc., 2028 North First Avenue, Birmingham, Edward S. Moore, president, has taken bids on a general contract for a proposed six-story and basement service, repair and garage building, to cost about \$250,000 with equipment. Warren, Knight & Davis, Empire Building, are architects.

The Huey & Philip Hardware Co., 1029 Elm Street, Dallas, Tex., has awarded a general contract to the Rogers & O'Rourke Construction Co., Industrial Building, for a new multi-story storage and distributing plant, 80 x 161 ft., to cost about \$125,000 with equipment. Lang & Wittchell, American Exchange National Bank Building, are architects. George Trumbull is president.

The Gulf States Utilities Co., Beaumont, Tex., is planning for extensions in its local Neches power plant, to include the installation of a new 40,000-hp. turbo-generating unit, two 1500-hp. watertube boilers, and auxiliary equipment, with additional transformers, outdoor switching equipment, etc., to cost more than \$500,000. The present plant has a capacity of 20,000 kw. The company is operated by the Engineers' Public Service Co., an interest of Stone & Webster, Inc., 49 Federal Street, Boston.

The Alabama Concrete Pipe Co., Birmingham, has begun the construction of a new plant for the manufacture of concrete pipe sections. The initial unit is estimated to cost

close to \$30,000 with machinery. W. T. Weaver heads the company.

The Dixie Gas & Utilities Co., Galveston, Tex., has acquired the property of the Commercial Gas Co., operating in the vicinity of Longview, Tyler and Waskom, Tex., for \$1,000,000. The purchasing company plans the early construction of a new pipe line from Tyler to Palestine, Jacksonville and Rusk, Tex., for natural gas service, to cost more than \$300,000. W. L. Moody, III, is head of the company.

The Cosmos Carbon Co., operated by the United Carbon Co., Charleston, W. Va., has plans for the construction of a new carbon black plant at Alexander, Tex., of five-unit type, with branch plant of three-unit design at Norrick, in the same vicinity. The plants are reported to cost in excess of \$400,000 with equipment. J. H. Alexander, Borger, Tex., will be in charge of construction.

The Hacker Machinery & Supply Co. has changed its name to Hacker Machinery Co., located at 847 Electric Building, Houston, Tex. This company handles machine tools, machine shop and factory equipment, including small tools and specialties, and is interested in securing additional lines for its territory.

Pacific Coast

SAN FRANCISCO, Aug. 17.

THE Graham Brothers Co., Lynch Road, Detroit, manufacturer of motor trucks, has awarded a general contract to J. F. Shepherd, First National Bank Building, Stockton, Cal., for a one-story assembling plant, 90 x 540 ft., at Stockton, to cost in excess of \$200,000 with machinery. John M. Burke, 318 East Miner Street, Stockton, is engineer.

The Pacific Coast Steel Co., San Francisco and Los Angeles, has plans maturing for a new mill at Long Beach harbor, with main units to cost in excess of \$1,000,000. The project will include a dock and warehouse, 300 x 600 ft. Work will start early in October, under the direction of the Pacific Dock & Terminal Co., Long Beach, an affiliated organization.

The W. B. Foshay Co., Minneapolis, Minn., operating public utility properties, has concluded arrangements for the purchase of the Desert Power & Water Co., Kingman, Ariz., Clay Pool Water Co., Claypool, Ariz., and the J. J. Mackay Water Co., Lower Miami, Ariz., and will consolidate the properties. Plans are under way for extensions, including the installation of pumping machinery, power equipment, transmissions lines, etc. The Foshay organization has also purchased the plant and property of the Utah Valley Gas & Coke Co., Provo, Utah, and plans expansion in this section.

The Ingram Paper Co., 1112 Santa Fe Avenue, Los Angeles, will take bids at once for a one-story storage and distributing plant, 150 x 165 ft., to cost close to \$90,000, including conveyers, hoists, elevating equipment and other handling apparatus. John M. Cooper, Rives-Strong Building, is architect.

The Pacific Portland Cement Co., Consolidated Pacific Building, San Francisco, is planning the early rebuilding of the portion of its mill at Plaster City, Nev., destroyed by fire Aug. 11, with loss reported at more than \$150,000 including equipment.

The Yuma County Water Users Association, Yuma, Ariz., Barry Dibble, consulting engineer, has tentative plans for a new hydroelectric power development at the Laguna Dam, to cost more than \$1,250,000 with transmission system.

The Doran Brass Foundry Co., 75 Horton Street, Seattle, has plans for a one-story addition to cost close to \$20,000 with equipment.

The Grays Harbor Railway & Light Co., Aberdeen, Wash., is completing plans for a hydroelectric power generating plant on the Cowlitz River, near Moss Rock, Wash., to cost more than \$6,000,000 with transmission system.

The Kellogg Power & Water Co., Kellogg, Idaho, plans the installation of power equipment and pumping machinery in connection with extensions and improvements in its water system. The entire project will cost close to \$100,000.

The Board of Education, San Bernardino, Cal., has plans nearing completion for initial buildings for its proposed new junior high school group, including manual arts unit. The structure will cost \$170,000. Eugene K. Martin, Fleming Building, San Bernardino, is architect.

The Electric Steel Foundry, 475 North Twenty-fourth Street, Portland, Ore., will erect a storage building, shop and craneway.

The G. G. Gerber Sheet Metal Co. plant, Portland, Ore., was moved recently from 431 Davis Street to a new location on Eleventh Street. New machinery and equipment was installed.

P. & C. Tools, Inc., 388 Burnside Street, Portland, Ore.,

has been organized and has taken over the business of E. A. Boyd & Co., to distribute the products of the P. & C. Hand Forged Tool Co., Milwaukee, Ore., in Arizona, Idaho, Nevada and the Pacific Coast states.

Canada

TORONTO, Aug. 22.

WHILE no large lists have appeared during the week, orders for single tools have been good and the total volume of business runs into a fair average. Buyers and sellers are showing much interest in the exhibitions of machinery and tools that will be held in Toronto during the next four weeks, and considerable new business is expected to develop as a consequence. The Steel and Power Show to be held in Toronto next week will also prove a source of information to equipment buyers.

Dealers are more optimistic in the fall outlook for the machine tool trade than they have been for some years. Industrial development has been making steady progress and numerous projects are under way for which equipment has still to be purchased.

T. T. Irving, regional chief engineer, Canadian National Railways, New Union Station, Toronto, is receiving bids for the construction of locomotive erection and machine shops at Point St. Charles, Montreal.

Bids will be received by John A. Clark, township clerk, Fonthill, Ont., until Sept. 1, for the construction in the township of Thorold, Ont., of a waterworks pumping station, filters, elevated tank, machinery and other equipment. Willis Chipman, Mail Building, Toronto, is consulting engineer.

Bernard H. Prack, architect, 42 James Street North, Hamilton, Ont., is receiving bulk tenders for an addition to the plant of the Canadian Goodrich Co., Ltd., 521 King Street, West, Kitchener, Ont., to cost \$150,000. The building will be three stories, 100 x 132 ft., of steel and brick.

The Miner Rubber Co., Granby, Que., plans an addition to its factory to be two and one-half stories, 60 x 120 ft., and to cost \$100,000.

The Ste. Anne Power & Paper Co., Ste. Anne de Beaupre, Que., plans the erection of a pulp and paper mill at Murray Bay, Que. J. T. Donahue, Murray Bay, is president.

Bids have been received and contracts will be awarded immediately for the erection of a \$160,000 factory at Windsor, Ont., for the United States Playing Card Co. It will be 90 x 422 ft., of brick and steel construction. Pennington & Boyde, 2 Bartlett Building, Windsor, are architects.

F. Milburn, 79 Fielder Avenue, Chatham, Ont., has the masonry contract for an addition to the plant of the Chatham Malleable Steel Co.

Sherbrooke, Que., will start work immediately on the construction of a power plant, contracts to be let by the City Council. A crane and electrical equipment will be purchased.

The Fraser Brace Engineering Co. will start work on the fourth Gatineau Power Co. development plant and dam on the Gatineau River, at Nigger Rapids, a short distance from Ottawa, Ont., in the not distant future. The plant will be constructed along similar lines to the one at Farmer's Rapids, and the initial installation will be for the development of 120,000 hp.

The General Combustion Co., Ltd., 1154 Beaver Hall Square, Montreal, has been incorporated and will operate manufacturing plants at Brockville and Ottawa, Ont., and warehouses at Edmonton, Alta., and Regina, Sask. At Brockville the company will manufacture domestic heating furnaces, industrial furnaces, forced-draft combustion systems, induced draft combustion systems, domestic heating boilers, fire extinguishers, plumbing trade fittings and electric furnaces. Dr. Milton L. Hersey is president, and Norman M. Campbell, vice-president of the company.

Excavation work for the new 3,000,000 bu. addition to elevator No. 3 for the Montreal Harbor Commission, Montreal, is nearing completion, and work in connection with the sinking of the piling will be started immediately. Contractors are Quinlan, Robertson & Janin, 702 Sherbrooke Street, West. Tenders for construction of the foundation will probably be called this week, and other contracts, including machinery and equipment, will be awarded later.

The Willys-Overland Co., Weston Road, Toronto, has plans for an addition to its plant.

Harkness, Loudon & Hertzburg, consulting engineers, Confederation Life Building, Toronto, are completing plans for a three-story and basement addition to the plant of the

Telfer Paper Box Co., 14 Duncan Street, Toronto, to cost \$100,000. Bulk and separate tenders will be called. The building will be 70 x 130 ft., of reinforced concrete construction.

Western Canada

Smith Brothers & Wilson, Ltd., Regina, Sask., have the contract for the erection of a distributing warehouse at Weyburn, Sask., for the International Harvester Co., to cost approximately \$160,000. The company also proposes to build a service plant.

The B. C. Gypsum Co., New Westminster, B. C., will spend \$50,000 on an addition to its plant on the Fraser River. The building will be of corrugated iron construction, 200 ft. long.

Foreign

THE Pan-American Petroleum & Transport Co., 120 Broadway, New York, is completing plans for a new oil refinery in the Maracaibo district of Venezuela, for handling an initial daily capacity of 60,000 bbl. of crude oil, to be secured from the neighboring properties of the Lago Oil & Transport Co., an affiliated organization. The entire project is reported to cost in excess of \$600,000 with equipment.

The Ministry of Public Works, Buenos Aires, Argentina, has approved a project of the Department of Sanitary Works for two new plants for the production of ferric alumina for city water purification, for which plans will be completed at an early date. One of the plants will be located at San Isidro, a suburb of the city, to be equipped for an output of about 200 metric tons per day, estimated to cost \$840,000 with machinery; the other plant will be built within the city limits, and will have a capacity of close to 150 metric tons daily, with estimated cost placed at \$425,000. Plans will be drawn by the department noted, and bids are expected to be asked for equipment in the near future. The American Consulate Buenos Aires, H. Bentley MacKenzie, assistant commercial attaché, has information on the project.

The Rhine-Westphalia Electric Power Co., Essen, Germany, is perfecting plans for a new hydroelectric generating plant at Herdecke on the Ruhr River, vicinity of Dortmund, with initial installation to consist of four turbine units, each with capacity of 4300 hp. A transmission line will be built. The project is reported to cost more than \$1,000,000. The company has recently disposed of a bond issue of \$15,000,000 for expansion, financing and general operations.

The Ministry of Public Works, Porto Alegre, State of Rio Grande do Sul, Brazil, is considering the construction of a hydroelectric generating plant on the Jacuhy River, with initial output of about 80,000 hp. A transmission line will be built.

The National Lead Co., 111 Broadway, New York, has concluded arrangements for the purchase of the Titan Co., Norway, manufacturer of titanium paint pigments, etc., including a plant for the production of such products and extensive deposit of ilmenite, the ore from which titanium is produced. The acquired interest will be continued as a subsidiary and plans are under consideration for expansion in production.

The State Electricity Commission, Victoria, Australia, is asking bid until Oct. 24 for armor-clad switch gear and accessory equipment for its electric power development. Specifications on file at the New York and Chicago district offices of the Bureau of Foreign and Domestic Commerce.

A number of important construction projects in Argentina have been reported recently to the Commerce Department by Assistant Commercial Attaché H. Bentley MacKenzie, Buenos Aires. These include seven warehouses and eleven airplane hangars, all of reinforced concrete, Buenos Aires; a new post office building for the city of Tucuman, for which an expenditure of 892,623 paper pesos has been approved (current value of paper peso is approximately \$0.42); an arsenal at Cordova costing 15,000,000 paper pesos; a dam and allied works on the River Primero, near San Roque; tenders authorized for material and equipment, needed in the reconstruction of certain docks in Buenos Aires.

The unusual prosperity enjoyed by Colombia during the past five years has stimulated the importation of industrial machinery, with the result that imports of this class of equipment from the United States alone have risen steadily from \$1,537,000 in 1922 to \$4,179,000 in 1926, reports Commercial Attaché William Boaz, Bogota, made public by the Department of Commerce. The most spectacular increase of this period took place in 1926, imports for that year showing an increase of 47 per cent over 1925. The most important group of industrial machinery entering the country from the United States, other than miscellaneous equipment, is that of mining, oil-well, and pumping machinery.

Of the imports credited to this group for 1926, valued at \$560,297, \$454,710 represented oil-well and pumping machinery, imports of oil-well machinery alone accounting for \$355,499. The power pumps supplied by the United States were valued at \$88,211. The increased importation of metal-working machinery from the United States is most noteworthy, rising from \$76,544 in 1924 to \$243,818 in 1925, or more than three times the previous figure.

The Municipal Water Department of Prague, Czechoslovakia, is engaged in the preparation of a plan for a water conduit costing 4,000,000 crowns (value of crown is approximately \$0.03) according to a report from Vice Consul Frank P. S. Glassey, Prague, made public by the Commerce Department. It has also been decided to construct a pressure conduit from Podol to Smichov at a cost of 1,350,000 crowns.

An immediate development of St. John Harbor, New Brunswick, will be undertaken under national supervision in the near future, and will involve an expenditure of probably \$14,000,000, spread over a period of five years, according to a report from Consul Romayn Wormuth, St. John, made public by the Commerce Department.

The Bengal-Nagpur Railway has evolved a five-year development program which provides for an expenditure during the current year of 32,438,000 rupees (\$11,678,000) of which 13,266,000 rupees are allotted to new construction and 19,172,000 rupees to the improvement of existing lines, says a report from Vice Consul Richard R. Willey, Calcutta, made public by the Commerce Department.

Approval has been given by the public works and finance committee of the Buenos Aires City Council for the construction of a new garbage burning plant, with a capacity of 450 tons daily, at Nueva Pompeya, according to advices received in the Commerce Department from Assistant Trade Commissioner Mason F. Ford, Buenos Aires. The cost of this plant is estimated at 1,000,000 paper pesos (\$425,000).

The City Council, Bradford, England, has approved a proposal to begin the development of an improved central area within the city through the construction of a block of shops and offices costing £230,000 (\$1,119,000), according to a report from Consul A. R. Thomson, Bradford, made public by the Commerce Department. Application will be made to the Ministry of Health, London, for the sanction of this expenditure. Including various schemes which the municipality has in view, it appears probable that the people of Bradford will eventually be called upon to provide nearly £3,000,000 (\$14,600,000) for a variety of building projects.

The city of Montreal is preparing to make an expenditure of \$750,000 on the enlargement of the city's sand filter system, according to a report from Consul Harry M. Lakin, Montreal, made public by the Commerce Department. The increased capacity will be 100,000,000 gal. a day. Tenders have already been opened covering this project, which is part of the plan for the improvement of the city's aqueduct system to meet the growing requirements of Montreal.

The budget of Chosen for the fiscal year 1927-28 includes items for construction totaling more than 37,000,000 yen (current value of yen is approximately \$0.47). The largest item, namely, 19,000,000 yen, is for the construction and improvement of railroads, followed by an item of 5,993,000 yen for irrigation and 2,600,000 yen for river improvement. The subsidies granted include 1,605,300 yen for public works and 4,300,000 yen for private railroads.

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